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NESTING OF THE BALD EAGLE

BY A. F. GANIER

My first expedition in quest of a nest of the Bald Eagle (*Haliaetus leucocephalus*) dates back to some thirty years ago. At that time I was living in the lower Mississippi Valley in the little city of Vicksburg, Mississippi, when word was brought to me of an eagle's nest about twenty miles above town at a lake which lay secluded among the cypress swamps. I at once began to lay plans and entertain visions of collecting the eggs for my fast growing collection. Ben, my partner in the egg collecting game, was a poor climber himself, but flattered my youthful confidence by picturing what a mere everyday affair it would be for me to scale the mere hundred feet or so, and then how thrilling it would be to look over the brim at two great white eggs of the King of Birds. The day of days finally arrived, the 5th of April, 1899, to be exact, and we sallied forth well loaded down with climbing irons, ropes, lunch, camera, and last but not least a box filled with cotton in which to pack the eggs. We left the train at an obscure little station and, after inquiring the way to Cypress Lake, we launched forth on a four-mile trek through an unbroken forest. Our boyish spirits were keyed up to the highest pitch and I never recall a more pleasant tramp, with sunlight breaking through the trees overhead and woodland voices all about us. As we approached the lake, however, our troubles began. We were beginning to tramp through shallow water and before open water was reached we were knee deep and all but lost in a jungle of "button willow" bushes. No one lived at the lake and no boat could be found, so we began a tedious tramp, peering overhead meanwhile, trying to locate the eagle's nest among the tree-tops. To make a long story short, we finally came upon the eyrie at three o'clock in the afternoon, and to our dismay we saw that it had been built among the topmost branches of a giant cypress tree, larger than we had ever dreamed of. The trunk was about eight feet in diameter at shoulder height, and since it was approximately sixty feet up to the first limb we decided that after all the eggs weren't worth

the effort and that it was about time to start back to the railway station anyway.

A good many years passed between that first eagle's nest and my second. A good many events crowded into my life other than bird study and, too, I may have been influenced by the impression I had gotten to the effect that an eagle's nest was not a climbable affair after all. And so it happened that it was not until 1919 that I had the pleasure of looking upward into another great cypress tree to view my second nest. The site of this nest was in the low forest which borders Reelfoot Lake, Tennessee, at its upper end. This lake, lying in the extreme northwest corner of the state and close to the Mississippi, was formed by an earthquake in 1812. It is from two to four miles wide and about twelve miles long. Cypress trees, which were submerged when the lake was found, continue to grow where the water is less than three or four feet deep and large areas are grown up in saw-grass. "Black Slough" is a shallow wooded swamp in the low forest, above referred to, and here in a large old cypress was the first of three nests which I succeeded in finding at this lake. At the time of my visit, on May 30, the young had just left the nest. It was constructed almost entirely of dead cypress limbs and twigs and, due to the decay resistant quality of this wood, the nest, though old, was in good condition. The interior lining was composed largely of cypress bark which, like cedar bark, is very fibrous and may be torn from the trees in long and pliable strips. The outer portions of the nest, the limbs below and the ground underneath were much soiled with excreta ejected by the young before they left. This description of a nest is quite applicable to seven others which it has been my good fortune to find.

The next nest located was at the southwest corner of the lake, in a very similar environment and about five miles southwest of Black Slough. It was built near the top of one of the largest cypress trees I have ever seen and which was dead at that time. A conservative estimate of its height would be 125 feet. It reminded me of the nest visited when I was a boy so I made no attempt to scale its dizzy height. My visit here was on May 26, 1921, and as in the previously described nest, the young had already taken flight. I believe that this site had been selected for the reason that within a few hundred feet was a long established nesting colony comprising some two hundred and fifty nests of the Great Blue Heron and fifty nests of the Double-crested Cormorant. The young of these birds doubtless come in quite

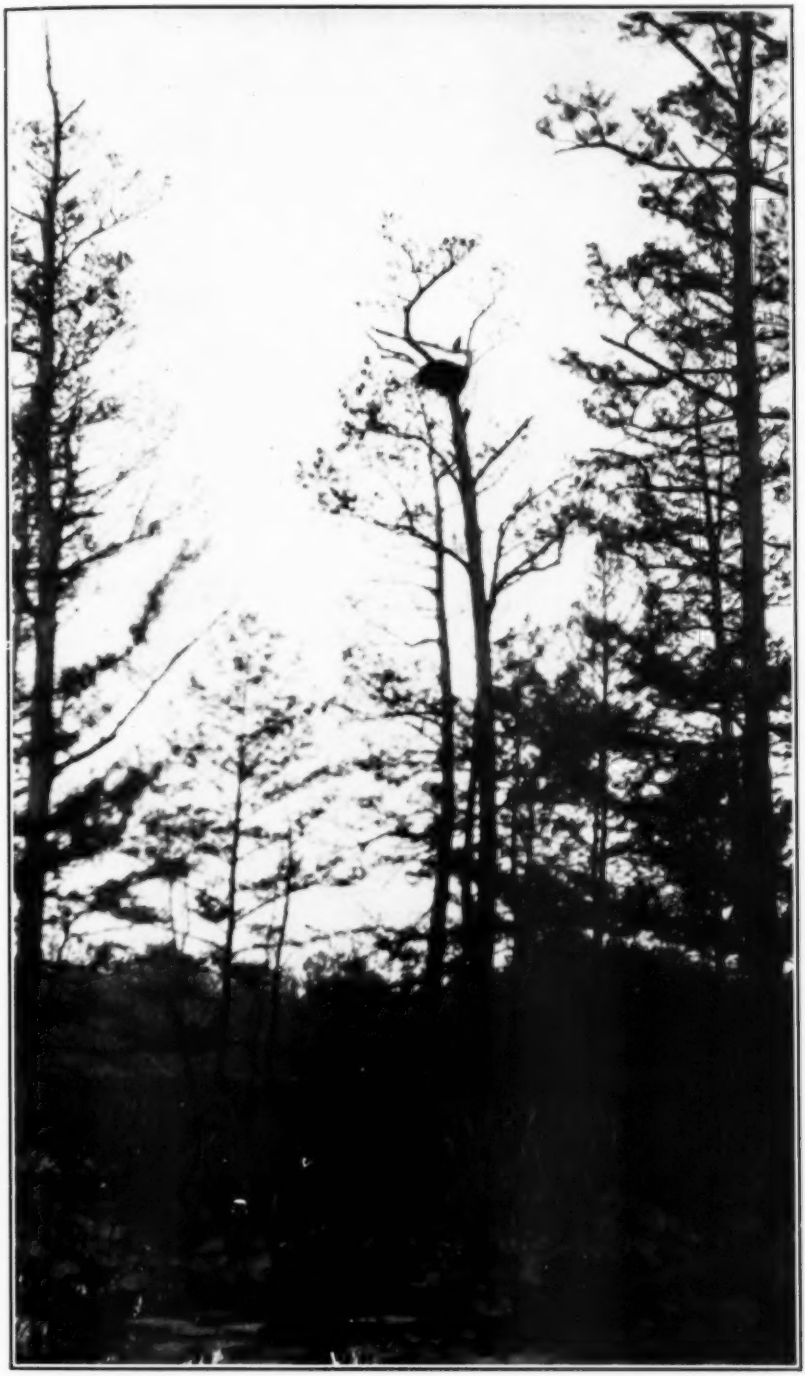

FIG. 1. Nest of the Bald Eagle in the "Scatters," Reelfoot Lake, Tenn.

handy to vary the bill of fare of the young eagles and of course the inhabitants of the rookery can do nothing less than pay tribute.

The third and last nest at Reelfoot, I found well out into the lake, about two miles east of the one last described. It differed from the others in that its location was quite open, being built in a living cypress in a narrow fringe of these trees which form one of "the scatters", projecting far out into the open water. The eyrie was easily visible from a distance and the tree was not a particularly large one. The nest was some sixty feet above the shallow water in which the tree grew. On the date of my visit, May 24, 1923, the one large young bird which the nest held, appeared to be quite capable of taking its first flight and spent most of its time perched on limbs several feet from the nest (Fig. 1). Many irresponsible hunters and fishermen visit this lake, some wishing nothing better than to take a pot shot at an eagle, so it is quite probable that as many young eagles are shot from this nest as leave it on full-fledged wings. I have endeavored, on my several trips to Reelfoot, to do missionary work on behalf of these splendid birds but find it difficult to convince irresponsible people, chiefly visitors, that they should refrain from shooting an eagle.

For some years I had been getting reports of a swamp-surrounded lake some twenty miles southwest of Memphis, Horseshoe Lake by name, where more than one Bald Eagle was said to breed. I had pretty well combed the Tennessee lowlands and had come to the conclusion that nowhere else in this area than at Reelfoot, could a nest of this species still be found. On March 9, 1930, Mr. B. B. Coffey, of Memphis, and myself, with a small group of local bird students, visited Horseshoe Lake and spent the day with interesting results. On arrival, we embarked in a motor boat and after a twenty-minute cruise, had the pleasure of sighting an eagle's nest built near the edge of a low wooded island around which the lake made nearly a complete circle. This island was almost a mile long and was covered with virgin forest, immense white oaks predominating. It is owned by a hunting club which has for some time given protection to the eagles and which has also stocked the place with deer.

As our boat neared the shore, we had the pleasure of seeing a fine white-headed eagle sitting on a branch near the nest and another on the wing nearby. We landed, and as we approached the eyrie both birds circled about within a few hundred yards of us, giving vent to their shrill cries; but after a time they settled on trees some distance away showing no further concern. I supposed that this nest held eggs in

Photograph by B. B. Coffey.

FIG. 2. Climbing to a nest of the Bald Eagle in the Mississippi River Swamp Country. The rim of this eyrie was 103 feet from the ground. The nest held young birds, the eggs having been laid about Christmas time.

course of incubation, because of the fact that March 1st had marked the laying date of a pair in Arkansas, some sixty miles to the north, a few years before. The nest was built about seventy feet from the ground in a large elm (Fig. 4). The tree presented a swollen place in its trunk, some distance above the ground, which made climbing a difficult job, so I postponed the attempt, hoping to find another nest more accessible. After a short search we found a second nest not far away, built in an immense oak, but since no eagles were about we passed it by. Cruising along the shore, flushing flocks of ducks and cormorants here and there, we espied a third nest, also on the island, and drove the boat through the willows to the shore. Wading several shallow sloughs we approached the nest tree and again had the thrill of seeing a fine white-headed eagle leave it, joining its mate in the air. The pair then sailed around above us within a few hundred feet of our heads, voicing disapproval and giving us a wonderful example of how bold these birds will become if afforded protection. I resolved to climb this tree without searching further. The tree was a white oak and the nest, measured later, was 103 feet above the ground. Due to the trunk being clad with rough, loose bark, progress was slow and it required nearly an hour of gruelling work to reach the nest. Resting on a branch a few feet below the big platform (Fig. 2) I surveyed the forest about me. To the west, at a distance of a half mile and at the far end of the island, I was pleasantly surprised to see still another eagle's nest (Fig. 3) and this, when later visited, was found to be occupied. It was built in a large white oak about eighty feet up.

A stiff chilling breeze and swaying branches made the last ten feet of my climb more or less of an adventure, but I finally succeeded in working my head and shoulders through the rim of the nest and looking upon the eyrie. I was totally unprepared for the sight which greeted me for there, standing before me with mouths open and feathers bristling, were two young eagles nearly as large as their parents. They were apparently nearly ready to fly and were as black as vultures. After noting the nest carefully I descended and we visited nests number four and number one. Both of these were found to have two young which, as well as I could judge from the tops of nearby trees, were of about the same age as those more closely examined. By comparison with the pictures taken by Professor F. H. Herrick, I judged them to be about fifty days old. Allowing thirty-five days for incubation it would appear that the eggs of these three pairs were laid prior to Christmas, a date rather surprising for any location north of the latitude of southern Louisiana.

The valley immediately adjacent to the Mississippi River, from Memphis southward, is doubtless the last great stronghold of Bald Eagles in the interior of the United States. The meandering river itself contains many wooded islands and "old rivers", formed by cut-offs, while nearby are numerous extensive cypress swamps and lakes of considerable size, some of which are bordered by low woodlands and uninhabited areas. Such of this area as is on the river side of the

Photographs by Coffey and Ganier.

FIGS. 3 and 4. Two nests of the Bald Eagle near Memphis. They were built in giant oak and elm trees and had been in use for years.

great levees is usually under water through the nesting season and this affords protection against human visitation. More than a dozen pairs are known to breed here, and a more complete census of their numbers is now under way.

There is some evidence to support a belief that the Bald Eagle has bred and may still nest in cliffs in the mountainous sections of Tennessee, North Carolina, and Georgia, this evidence being the taking of this species there during the early spring.

NASHVILLE, TENN.

THE INFLUENCE OF TEMPERATURE ON MIGRATION

BY JOHN S. MAIN

In studying the spring migration of birds it is interesting to consider the influence of the weather as affecting the time of their arrival, either at their final destination or at any given point along the way.

At the outset questions arise: What part does the weather play in initiating the northward movement? What part does temperature play? Assuming that a rising temperature at the proper season encourages migration, how high must it rise above normal in order to become effective? Does abnormally warm weather at the starting point cause an abnormally early departure? Does the temperature that prevails in the region toward which the birds are traveling affect the time of their arrival?

Most of these questions have already been discussed at length and have perhaps been answered as definitely as it will ever be possible to do, but unusual conditions arise from time to time which illustrate the play of cause and effect and help to confirm our opinions if they do not add greatly to our knowledge. Such is the case with certain events of the past two winters (1929-30 and 1930-31) and it is the striking contrast afforded by them which forms the subject of this paper.

Speaking for the vicinity of Madison, Wisconsin, where the writer resides, weather conditions during the winter of 1929-30 were, for the most part, in no way remarkable. There were fifteen sub-zero days, seven of them being −11°, or more. Once it reached −20°, and again −24°. The mean temperature for December and January was 2° below normal; from February 1 to 18 it was 4° above normal. On the latter date, however, a decided change took place. The mercury rose rapidly. On the 19th it reached 56° above zero, on the 20th, 57°, on the 21st, 60°. For five successive days the maximum all-time heat records were broken, the week ending February 25 showing a mean temperature of 28° above normal!

How did this affect migration? Let us take for examples the Bluebird, Robin, Meadowlark, Bronzed Grackle, and Killdeer, which, with the Red-winged Blackbird and Song Sparrow are the first of the small birds to arrive. Bluebirds and Killdeers appeared February 21, Robins and Meadowlarks on February 22, and Bronzed Grackles on February 26. None of these birds ordinarily arrive much before March 10, and the dates above given are, with one or two possible exceptions in the case of the Bluebird, from a week to ten days earlier

than any previous records. It may be added that on February 24 several Song Sparrows and two flocks of redwings were seen, together with large numbers of Herring Gulls, mergansers, golden-eyes, Mallards, Black Ducks, Pintails, and Coots, affording abundant evidence of a widespread movement into this area during that week. For the purpose of this study, I am confining myself to the five species first named because of the fact that, with rare exceptions, none of them winter in this region and the first individuals seen in the spring can

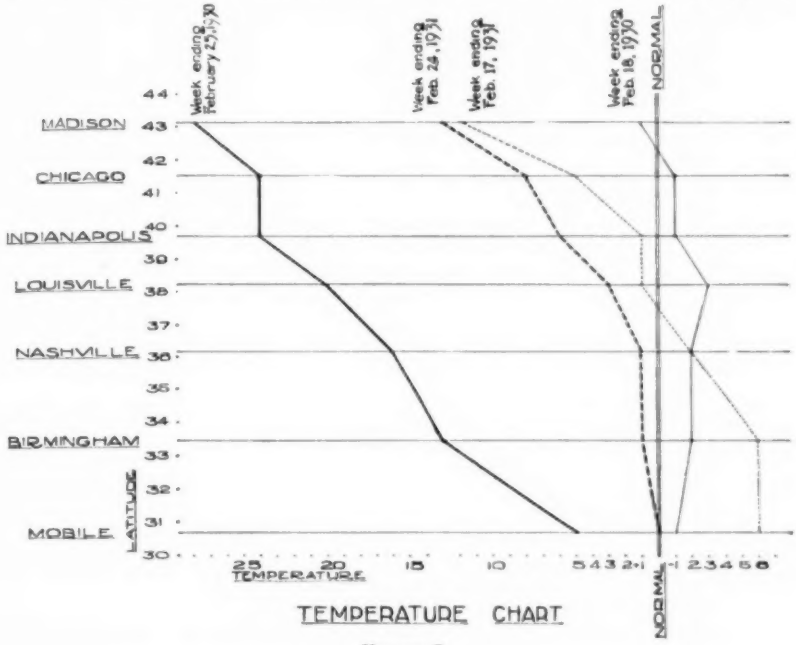

FIGURE 5.

be assumed to be migrants, especially if two or more individuals of a species are observed in different localities on the same day.

Let us now turn to the winter just passed, that of 1930-31. It was indeed a very exceptional one. There were only five sub-zero days. The coldest was –4°, setting an all-time record; the mean temperature for December, January, and February was the highest in 41 years; *the month of February was the warmest in 49 years.* February, moreover, was entirely free of storms, the weather generally fair, the ground bare of snow. In brief, conditions more favorable to migration could hardly be imagined.

With this state of affairs existing it might reasonably be expected that there would be an unusually early return of the first migrants, as

occurred in February of the previous year. On the contrary, of the five species first mentioned three did not appear until the first week in March, and the others not until the second week, the dates being as follows: Robins, March 4; Bronzed Grackles, March 6; Meadowlarks, March 7; Killdeers, March 9; Bluebirds, March 12. While somewhat earlier than usual, these dates were, on the average, *two weeks later than the arrival dates in 1930.* What is the explanation?

The answer to this, and possibly to the other questions raised in the opening paragraph of this article, will, I believe, be found in the sub-joined chart, which pictures for each year the conditions that prevailed in the regions to the southward during the period referred to. It shows that in both 1930 and 1931 substantially normal temperatures prevailed during the week ending February 18. In 1931 the temperatures for the succeeding week were only a little above normal throughout the wintering range. In 1930, however, the conditions were strikingly different. As shown by the chart, the temperatures during the week in question were excessively high all the way from Madison to the Gulf—so high as to incite the birds to an abnormally early departure and also to hasten the progress of their journey.

The various cities named on the chart were selected merely to show the temperatures that prevailed in certain areas, not to indicate any definite migration route. Indianapolis, for instance, has approximately the latitude of Springfield, Illinois, and their temperatures were much the same. Similarly, Mobile is made the southern terminus of the graph for the purpose of showing the extent of the warm wave of 1930, not to suggest that any of these migrants started from there. It is, however, probable that the Bluebirds and Meadowlarks wintered that year as far south as southern Illinois, while the Killdeer, Bronzed Grackles, and even the Robins may have come from Kentucky or Tennessee.

The distance covered within the week would probably be 250-450 miles, indicating a much more rapid rate of travel than has commonly been assumed for the early migrants.

All temperature records on the chart are taken from U. S. Weather Bureau reports.

Madison, Wisconsin.

A WINTER ROBIN ROOST IN ARKANSAS

BY J. D. BLACK

During the three recent winters (1926-27, 1927-28, and 1928-29) there have been roosts of varying size including the common and southern varieties of the Robin (*Turdus migratorius migratorius* and *T. m. achrusterus*) situated in and around Winslow, and during the past winter the writer had the opportunity to study their habits closely, the 1928 roost being only about a mile north of his home and containing at one time over 250,000 individuals.

Winslow, known throughout the south as "The Top of the Ozarks", has an elevation of 1734 feet at a central point in the village, and the surrounding territory, or rather most of it, is considerably higher, some places being as high as 2500 feet above sea level. The immediate vicinity of Winslow is covered with deciduous growth, the various oaks, hickories, maples, etc., being the most common trees. It has been, and still is, a considerable lumber center, with great numbers of trees being cut, leaving a heavy growth of underbrush over a large proportion of the land. The 1928 roost, being occupied from October 22 to December 16, 1928, was situated on a hill, or hills, at the head of a small ravine, facing east, although some of the birds roosted in the ravine itself, at an elevation of about 1800 feet.

The roost, when at its height, covered about a mile square, the birds never concentrating as they did in 1926, although being sufficiently thick to give the impression of immense numbers—concerning which we will deal later. The tract of land occupied has been closely cut over, leaving only occasional trees standing among the dense undergrowth, but the slopes of the ravine are well covered with small trees—nearly all second growth timber.

The first Robins arrived on October 22, and these were augmented by a few others before the first check as to the number present was made on the evening of the 24th, when an estimated number of 4,000 went into the roost. By the 28th there were at least 25,000 birds present, for six observers, covering less than half the territory surrounding the roost, reported 16,948 birds flying into the roosting grounds on that date.

The last actual check of the birds flying into the roost was made on November 7, when six observers, all well trained, covering only the south, southeast, east, and southwest, with the west half of the south section, the west, northwest, north, and northeast not being watched, listed over 74,000 birds going in. The estimates were carefully computed and the lowest figure adopted in all cases. The writer was in

the roost at the time of the flight and knows that more birds arrived from the north, northeast, and northwest, than from other directions, and believes that an estimate of 150,000 birds at that date is extremely low. The figure probably would have exceeded 200,000. Many more birds arrived after November 7 and at the time of their departure, on December 16, there were at least 250,000 birds roosting on this tract.

Due credit should be given here for the assistance of Robert Adkins, Paul Vandiver, Allen Land, and my brother, Olan H. Black, for their valuable assistance in helping check the flight of the birds, and to Paul Vandiver, Omer A. Winn, and Leonard Wallace (the last named accidentally shot and killed himself November 18, while hunting bobcats within the boundaries of the roost) for their generous assistance in the banding work carried on at night.

A study of the time of arrival of the birds at the roost, in relation to the direction from which they came, together with their speed of flight, and the time required for all the birds to pass over, leads to several interesting conjectures as to the distance covered in their search for food.

The check of October 28, being the most detailed from this standpoint, and covering the widest range of observation points, will be used to bring out these facts, the larger flights on later dates differing only in the number of individuals involved.

On this date my brother and Paul Vandiver worked together on the southeast, Robert Adkins handled the southwest, and I the east, while others were posted along the west, but it is regrettable that these observers (on the west) left their posts too soon for their work to be of any value on this point, and their reports have been eliminated.

From the southeast the first bird arrived at 4:25, and the flight proper commenced at 4:32, continuing almost steadily until 5:22, with the majority of the birds passing between 4:46 and 5:10. Seven thousand, eight hundred and ninety-two birds were listed from that direction, 3,000 from 4:56 to 5:00 P. M.

From the east I recorded the first bird at 3:45, five stragglers going in at that time, and five more at 3:49, while the flight proper commenced at 4:31, with a flock of 100, and continued until 5:10. The main body passed from 4:40 until 5:05, with 2,400 going over during the five-minute period from 4:45 to 4:50. The observations of Robert Adkins on the southwest coincided closely with those of myself, and were, on the average, ten minutes earlier throughout than the southeast reports.

The birds flew at an average speed of twenty-five miles per hour, being timed in various manners, on several different dates, the early arrivals sometimes flying as slowly as twenty miles per hour, and the late ones as fast as thirty.[1] On cloudy, dark days the birds would fly somewhat faster than on clear days, and would come in about fifteen minutes earlier. On clear days they usually made considerable commotion flying over, while on cloudy days they scarcely made a sound, flying as though the most important object in their lives was to get into the roost and comfortably settled before darkness overtook them.

The birds that came in from the southeast, and which arrived on the average ten minutes later than the others, all passed directly over Winslow and a strip of land from two to three miles wide that was barren, or nearly so, of the food they demanded. This distance possibly explains the difference in the time of arrival, but does not exactly coincide with the ten minute variation in the time. It is evident that they ranged slightly farther than the others.

Assuming that the Robins all left their feeding grounds at the same time, and traveled at the speed of fifteen miles per hour, occasional stops included, (flight speed of 25 miles per hour, allowance thus being made for rests, whether they were taken or not cannot be determined definitely, but it is supposed they did), and assuming that the first arrivals fed nearby, the conclusion would be reached that at least part of the birds fed at a distance of twelve and a half miles from the roost—the speed of flight being fifteen miles per hour and the period of flight covering fifty minutes over the southeastern sector. These are, of course only approximate figures, but have been pretty well substantiated by reports from points ten to fifteen miles away of flocks of Robins flying toward Winslow in the evening and appearing again from that direction in the morning. Some of the birds that appeared from the east during the first fifteen minutes of the actual flights often were seen coming from the trees of the first mountain east of the point of observation, while the late arrivals always were flying high and straight, as though from a great distance.

The birds lived, for the most part, on the berries of the Black Gum (*Myassa sylvatica*) during their stay here, although they con-

[1]Two methods of calculating the speed of flight were used. The first method required two observers, with synchronized watches, located at different points. A given bird was timed by each observer as it passed his station, and the records were later compared. The second method was operated by a single observer who timed a flying bird as it passed two points a known distance apart. The first method was discarded as unsatisfactory, and figures derived by the second method are used in this paper.

sumed vast quantities of the small Fox Grape, as well as various other berries that were available at that time of the year.

The Black Gum produced enormous quantities of berries last season and thus furnished food for these birds for a considerable period of time, the only logical explanation for their long stay here, and the reason for their leaving as well; for after the 18th of December hardly a berry was left on any of the gum trees I saw, and the same condition was reported by others for several miles around Winslow. The birds were observed to go into the roost in the same vast numbers on the evening of December 16, but not so much as a single bird was again seen until February 18, when they re-appeared in small numbers for the breeding season.

Most interesting to me of all was the behavior of the brids in the roost in the evening as they came in, and I spent several evenings in this study, making photographs of the birds while in the roost. Two typical days were the 30th of October and November 7.

To quote from my notes of October 30: "Robins were everywhere, and thousands more coming in all the time. Robins flying from the north, east, south, and west in continual streams, there being Robins coming to rest in trees nearby, others flying over hunting for suitable resting places, and still more Robins coming into sight on the horizon."

"They were in a singing mood and sometimes as many as five or six hundred would be singing at the same time! There was also a continual chattering and chirping as the birds settled down, this being underway when I arrived and still going on when I left."

Again on November 7, when there were many more birds present: "While the boys were checking the flight this evening, I was again on the hill where the Robins were settling and it was marvelous to watch, with many, many birds coming in. I arrived on the hill about 4:30 and left an hour later, and aside from the continual chirping and chattering the birds made another sound—like that of rain falling on dried leaves—caused by the birds' wings brushing the leaves as they went in and out of the bushes. This sound was continuous and very noticeable. They were singing very little this evening and never did I notice more than ten or twelve birds singing at the same time."

On an occasion or two I firmly believe that I heard as many as a thousand of these birds singing at the same time, the song accompanied by the rushing sound of wings; and the din of their incessant chattering as they settled down was a sound that made a deep and lasting impression on my mind—one that I will be able to recall vividly many

years from now. The birds that were singing would invariably seek the upper limbs of the large leafless trees, and sometimes I have seen forty or fifty birds singing in a single tree. You who have thrilled at the song of a single Robin in the springtime, can, possibly, imagine the effect of a thousand of these gifted vocalists in full song during the bleak days of early winter.

There was almost every conceivable plumage and type of Robin in the roost. Many semi-melanistic birds were there, very dark specimens, one being observed that possessed glossy black under tail coverts, while the others (of the dark type bird) usually had a blackish effect on the back and the rufous of the breast was considerably darker than the typical variety which breeds here. There was a third type—besides the common and the dark plumaged birds—which I have never been able to convince myself was referable to either *migratorius* or *achrusterus*, and certainly not the western variety (*propinquus*). They were considerably larger than the ordinary Robin and very pale, the feathers being distinctly edged with whitish, the rufous of the breast in some cases being exceptionally faint, and the white spots on the tail very large. All three types of birds roosted separately and were decidedly different in their behavior when captured. We knew the birds as Types One, Two, and Three, in the order described, (Type One, the blackish birds; Type Two, the typical *migratorius* and *achrusterus;* and Type Three, the large, pale birds), and found this a convenient way of referring to them.

With the assistance of the helpers previously mentioned I caught and banded an even hundred birds, all of which were reported as *migratorius*, because of the fact that there were so many hybrids and phases of plumage present that it was impossible to classify the birds properly, particularly at night, as to the subspecies. Type One never made a sound when captured and these birds were the delight of the entire banding crew. They seemed to roost in more open localities than either of the other two types, while the large whitish birds, the Type Three, were exceedingly difficult to capture, being very wary, always the first to take wing, always screaming loudly when netted, and roosting in the most inaccessible portions of the cover.

The birds banded were captured, in most instances, with a large, specially constructed net, much on the order of a butterfly net, only many times stronger, and somewhat larger. Some birds were caught by hand, and a few in a very small net, which was particularly useful in the very dense underbrush, where it was impossible to take the larger net, much less attempt to use it.

Dry, moonlight nights were excellent times to observe the restless traits of these birds, but it was impossible to even approach them on such occasions, they taking alarm a full hundred yards ahead, and flying off into the night in flock after flock; they made a roaring noise like thunder as thousands of birds took wing. They would occasionally fly a considerable distance but usually stopped, even on bright nights, after a flight of one or two hundred yards, and on dark nights they would go only a short distance.

The best time for banding work was on a very dark night, just after a rain, when the leaves underfoot were damp, allowing one to walk without making a crackling sound. Our best work was done in about three hours on such a night, when we banded thirty-nine birds. We would leave a burning lantern in the old timber road—this was necessary to keep from becoming lost—and would work on either side of the road with flashlights, spotting the bird and netting him, in this manner sometimes catching two at a time. Only one injury, a broken leg, resulted during the entire period, and this was caused by inexperience on the part of the captor, who became very adept after this accident. The bird injured was a large pale bird, belonging to Type Three, but the specimen was not preserved. The disturbance caused by a capture was great, but the birds were very capable of flight in the night, and soon were again at rest.

Both Barred and Great-horned Owls preyed continually upon the Robins, as did the bobcats, and house cats that had become feral. Red-tailed Hawks were usually to be seen sailing over as the birds came in late in the evening, but I never noticed any disturbance caused by the hawks, nor did they seem interested in the many Robins flying about.

The deep, gutteral "meow's" of the bobcats as they stalked their prey nearby and that almost terrifying snarl as they made the kill furnished a regular thrill that served to make the night work interesting. Assured by old hunters that they were perfectly harmless, I was confident that they would not attack; yet being continually followed by from one to four of these animals as they softly padded along uttering a regular purring "meow" always made me uneasy.

The most blood curdling sound of the woods was made, however, not by the cats, but by the Barred Owl, when after killing a bird he would let forth a medley of unearthly hoots, squawks, and screams that sounded as if the demons of Pandemonium were paying a personal visit to the roosting grounds.

On several occasions both species of owls as well as the cats would make kills so near that the dying sounds made by the Robins could be heard distinctly, the cats being particularly unmindful of our presence in this respect, one cat killing three birds within twenty-five feet of a party of four one night within a very few minutes. The toll these raptores and cats collected from the flock was enormous.

A résumé of the study produces these evident facts:

First, that the birds of the entire country—as shown by plumage variation—flock and feed together during the winter season, but segregate into small bunches, probably family groups and units of such, of their own race, at night.

Second, that in feeding they cover a radius of at least twelve miles. Thus the birds of a single roost range and feed over a territory of somewhat more than 452 square miles, at the least estimate.

Third, that their migration during the winter is decidedly irregular and determined solely, or nearly so, by the presence of desirable food.

And Fourth, that in banding together to protect themselves from their enemies they defeat their own purpose, as do most other birds with this habit, and, instead, open themselves to the united attack of every possible enemy for miles around.

WINSLOW, ARKANSAS.

CURVATURE OF WING AND SOARING FLIGHT

BY WILLIAM BREWSTER TABER, JR.

In his paper, "The Soaring of Raptorial Birds",[1] Mr. Palmer has brought our attention to the fact that soaring is made possible by upward moving air currents. However, in his explanation of the phenomenon he considers the wing to be flat. I would like to point out that the concave curvature of the under surface of bird wings is an essential factor in soaring flight, and the effects derived therefrom. The principle involved is identical with the principle of the impulse steam or water turbine which has been utilized in a commercial way by mechanical engineers for a hundred years or more.

In order to understand the principle it will be necessary to resort to a diagram employing the devices which engineers use. In figure 6 the heavy curved line *CD* represents the cross section of a bird wing, *C* being the thick, front edge. The bird is travelling to the left, horizontal to the ground as shown by the direction of the arrow above it.

[1]WILSON BULLETIN, March, 1931, pp. 18-24.

The letter *D* is the back edge of the wing (the tips of the secondary wing feathers).

In this whole discussion it must ever be kept in mind that the bird is entirely free from the ground, that the direction of air currents as observed from the ground does not affect the flight, but that flight is affected only by the relative direction of the air currents in relation to the wing. So as to make this more clear let us imagine that the bird is soaring in a horizontal position a mile above the earth, and that you, gentle reader, are a very minute creature, say a louse, perched on the front edge of the wing at *C*. Then the direction of the air current as observed by you would be identical with the direction of the current upon the bird wing. The fine lines in the diagram

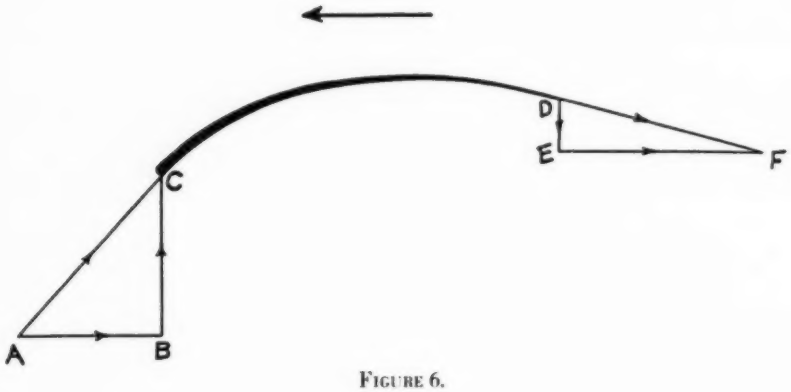

FIGURE 6.

such as *AC* or *EF* represent the velocities and directions of the air currents in relation to the wing. The direction of the current is shown by the arrow on the line representing that particular current, and the velocity of the current is represented by the length of the line.

Now to simplify matters let us consider our bird to be soaring to the left in an exactly horizontal direction in a current of air exactly straight up from the surface of the earth. The speed of the current upwards and its direction is represented by the line *BC*, the speed and the direction of the air rushing past the wing to the right is represented by the line *AB*. But since both air currents are acting on the wing at the same time, to you perched on the edge of the wing at *C*, there would seem to be only one current blowing and that would be in the direction of *AC* and its velocity is represented by the length of *AC*. It is easy to understand then, that so far as the effect upon the wing is concerned there is only one current acting upon it, and this is

represented in direction and speed by the line *AC*. In technical language the engineer calls this line *AC* the resultant of the two components *AB* and *BC*. If you can completely grasp this idea the rest is easy.

From the diagram it is evident, that under the particular conditions illustrated, the resultant current *AC* is of such a direction that it just slips in under the edge of the wing at *C*, sweeps around under the curved surface and off at *D* in the direction *DF*. Let us now suppose an ideal condition in which there is no friction between the current and the wing. Then the current leaves the wing at *D* with exactly the same speed at which it enters at *C*. Therefore I have drawn the line *DF* exactly the same length as the line *AC*. Now what effect has the change in direction of the current had upon the wing? To discover this it is necessary to separate the line *DF* into two components, one vertical and the other horizontal, for we wish to find out if the change in direction of the current caused by the curvature of the under surface of the wing tends to overcome the force of gravity which acts vertically (hence the vertical component), and tends to thrust the bird forward in the direction in which it is soaring (hence the horizontal component). These two components of the line *DF* are *DE* and *EF*. In other words the effect of the velocity of the current acting on the wing as represented by *DF* is equivalent to the combined effects of the velocities of two distinct currents, one acting straight downward with a velocity represented by *DE*, and the other straight backward with a velocity represented by *EF*.

Now it can be seen that the total lifting effect upon the bird is due not only to the lifting effect of the rising air current as represented by *BC* but in addition there is a lifting effect caused by the change in direction of the current due to the curved under surface of the wing, and this lifting effect is proportional to the length of the velocity line *DE*. Thus the total lifting effect is proportional to *BC* plus *DE*, which is considerably greater than *BC* by itself. If the bird is to maintain its altitude and still soar in a horizontal direction, *BC* plus *DE* must be of sufficient velocity to produce a lifting effect just great enough to overcome the force of gravity. If a greater lifting effect is produced the bird will rise. If a lesser lifting effect is produced the bird will lose altitude.

Now let us discuss the horizontal motion of the bird. By comparing the lines *AB* and *EF* it is readily seen that *EF* is longer than *AB*. Since the horizontal component of the line representing the velocity

of the air rushing out from the back edge of the wing, that is *EF*, is greater than the horizontal component of the line representing the velocity of the air rushing in under the front edge of the wing, there must be a thrust forward caused by this increase of velocity. The thrust forward will be therefore proportional to the difference in the length of the lines *EF* and *AB*. As in this particular ideal case there is no friction, the bird's velocity forward would be increased.

In practice, however, there is always some friction. Then too there is some loss of energy caused by eddying air currents under the front edge of the wing at *C* due to the resultant air current *AC* having such a direction that it does not exactly slip under the front edge. However it must be said that birds are able to make remarkably large adjustments of the slope of the wings in relation to the direction of flight as is so plainly shown in the admirable photograph of the Common Tern by Olin S. Pettingill, Jr.[2] Also there can be no doubt but that adjustments of the slope of the wings are automatically and continually made during soaring flight even though they may be so slight as to be unobservable by a person watching the bird. In spite of the quick and automatic adjustments that are continually being made there must nevertheless be in actual flight some losses caused by eddies and friction. Therefore *DF* can never be quite as great as *AC* and consequently the components *DE* and *EF* must be somewhat shorter than as shown. If the sum of *BC* plus the true *DE* is of sufficient magnitude to overcome the force of gravity the bird will rise, if not the bird will lose altitude. If it is only just enough to overcome the force of gravity the bird will just maintain its height. If the true *EF* is greater than *AB* the bird will increase its horizontal speed, if equal to *AB* it will just maintain its horizontal speed, if less than *AB* it will lose in horizontal speed.

There are countless adjustments and combinations of adjustments of wings, tail, position of head and legs whereby the bird may control the thrust forward and upward, which are too intricate and complex to discuss at present. However important these adjustments may be to successful soaring flight, it is certain that the essential factor is the concave curvature of the under surface of the wing, by means of which the directions of the air currents are changed, causing the necessary lift and forward thrust.

Greenwood Farm,
Kansas, Ill.

[2]Wilson Bulletin, September, 1931, Fig. 40, page 170.

CHARLES W. AND TITIAN R. PEALE AND THE ORNITHOLOGICAL SECTION OF THE OLD PHILADELPHIA MUSEUM

BY FRANK L. BURNS

The establishment and educational value of Peale's Museum, the first great public exhibition of objects of art and the natural sciences in America, was due to the tremendous energy and enthusiasm of the original proprietor and to its favorable reception by the public. The elder Peale personally collected, prepared, and placed on exhibition many indigenous species and, by purchase or exchange, a great number of exotic species of birds; corresponded with Saint-Hilaire, Cuvier, Lamarck, Weid, and Latham; exchanged with the great scientific museums of Europe and was visited by Humboldt and other distinguished travelers; yet the scientific importance of this pioneer institution, today, is almost entirely due to a small though reliable clique of Philadelphia naturalists, mostly ornithologists, who had either designated Peale specimens as their types, or more frequently, made this museum the repository for their type specimens.

Peale was famous for his natural ability and extraordinary industry as a portrait painter, especially of Revolutionary patriots, and for his great originality as a museum preparator; but he has not been conceded a permanent place among the early American naturalists, although his contributions toward the awakening of the popular interest in the subject, especially ornithology, has doubtless exceeded that of all his American predecessors.

Charles Willson Peale was born at Chestertown, Maryland, April 15, 1741; apprenticed at the age of thirteen years to an Annapolis harnessmaker; began painting portraits with little instruction until members of the Governors' Council sent him to London where he studied under Benjamin West, 1767-69. In 1774 he removed to Philadelphia and set up his studio under the patronage of Cadwalader, Dickinson, and others, and in 1776 he was commissioned an officer in the militia, which gave him opportunities to meet and paint his fellow officers. In a recent exhibition of his paintings there was shown a portrait of the great Commander-in-Chief, painted on a piece of blue and white twilled bed-ticking, while encamped at Valley Forge.

Captain Peale was indeed an indefatigable worker; his museum originated about 1784 in a frame annex to his residence on Third and Lombard Street, and from a portrait gallery, gradually embraced,

in the language of the original American showman, "everything that walks, creeps, swims, or flies, and all things else".

In 1792 he discovered the modern methods for the preservation of birds and beasts, and as he devoted almost his entire time to this work, his industry soon outgrew the accommodations and his collections were removed, in a spectacular parade of all the boys of the neighborhood, to the American Philosophical Hall, 1794.

The earliest museum publication I have seen bears the date of 1796, and although devoted to the quadrupeds, is entitled: "A Scientific and Descriptive Catalogue of Peale's Museum". Later the official title became the "Philadelphia Museum", though both Wilson and Ord designated it by the original name. In an introduction to a course of lectures on natural history delivered at the University of Pennsylvania in 1799, Peale remarked: "So irresistibly bewitching is the thirst for knowledge with science and nature that neither the want of funds, nor the leisure from other occupations, could damp my ardour". The text of these lectures has not been preserved, nor scarcely a scrap of technical matter, though the museum press printed its own guidebooks and pamphlets.

The Legislature having vacated in 1802, Peale was granted at a yearly rental of $400 the use of the State House, in which to exhibit his collections. This was the year in which the Franco-German Rafinesque landed and almost immediately described four supposedly new species of Javanese birds "dans la cabinet de M. Peale".

By 1805 Peale ingenuously stated that "there are in this collection, perhaps all the birds belonging to the Middle, many of which likewise belong to the Northern and Southern States, and a considerable number from South America, Europe, Africa, Asia, New Holland, and the recently discovered islands of the South Seas. The number exceeds 760 without the admission of any duplicates, contained in 140 cases".

Though he stated that each species was correctly identified and labeled with the Latin, English, and French names (with many nondescripts) actually there were many misnomers and no adequate catalogue, for the talented proprietor lacked the patience of the naturalist to study and make known this remarkable collection. He compared his specimens with the figures or descriptions of Catesby, Edwards, Pennant, or Linnaeus; and a refugee, Baron de Beauvois, helped him to identify some species by means of Buffon's works and to compose the French edition of the guidebook. Peale may have painted some of his subjects, and he did some engraving in mezzotint.

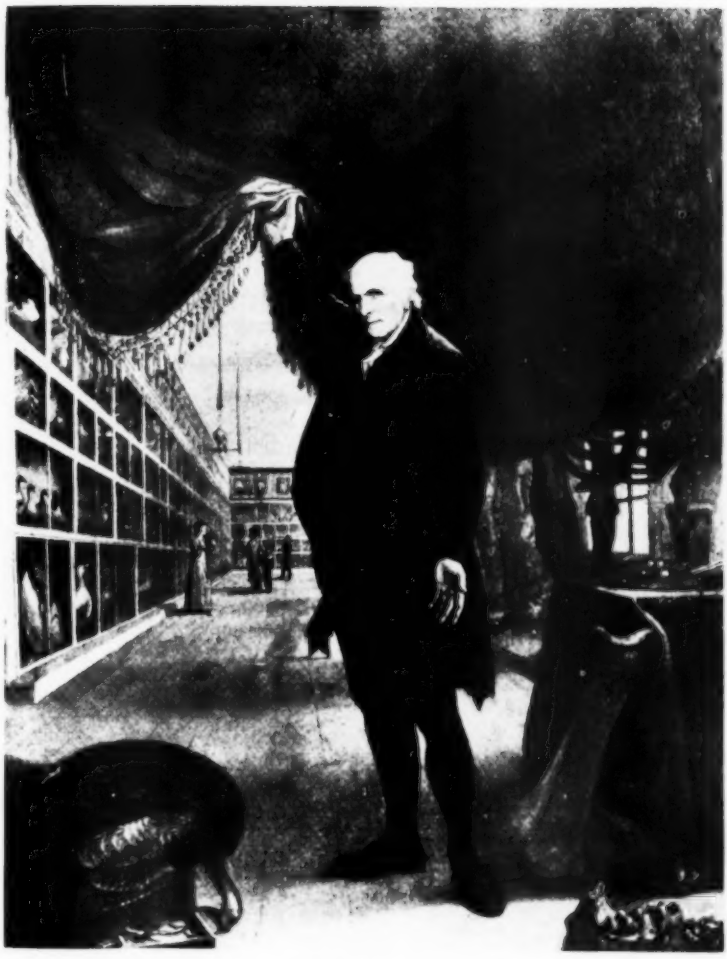

Fig. 7. Charles Willson Peale, and the Long Room of the Philadelphia Museum.

A manuscript, briefly descriptive of the collection, appeared in "A walk with a friend through the Philadelphia Museum, by C. F. Peale", preserved by the Pennsylvania Historical Society. It is undated though obviously it cannot be placed later than 1805. This ancient document is quite lengthy and evidently intended either as a rough draft of a résumé of his lecture in the mammal and bird rooms, or a serious attempt to compose a popular handbook. The "friend" is guided to Independence Hall and his attention called to the inscription on the front of the building, viz., MUSEUM. GREAT SCHOOL OF NATURE; and to the legend over the back door, viz., SCHOOL OF WISDOM. Admission and pamphlet cost twenty-five cents, and for the instruction of those who wished to know the Linnaean classification of birds, on the side of the door entering the long room on the second floor, a large frame contained the several orders and genera with the characters of each.

Knowledge of the arrangement at a later date appears confined to a series of numbers from 11 to 7789, applied by the curators to the types of Wilson, Ord, Say, and Bonaparte, the representatives of nearly 250 species and 300 specimens deposited or indicated by the above persons or by the Lewis and Clark Expedition (1804-5) and the Long Expedition (1819-20). It appears substantially the same as the antiquated Linnaean system with some adaptations to meet the requirements of the exhibition. A definite space seems to have been reserved for later accessions to all genera, though in some instances, especially the *Sylvia*, an overflow had occurred. There were many inconsistencies, for instance the Raven appears classed, probably for convenience, with the birds of prey, and the Kingbird with the shrikes; but in the latter Linnaeus had been followed; and better judgment than many contemporaries had shown, was evident in the inclusion of the Oven-bird, Water-Thrush, Black and White, Canadian, and Hooded Warblers with the *Sylvia*.

Peale's museum probably furnished Wilson with his only specimens of the Anhinga, Smew, Old-Squaw, Harlequin, and Labrador Ducks, Eider, Ruddy Duck, Flamingo, Scarlet Ibis, Whooping Crane, Purple Gallinule, European Oyster-catcher, Swallow-tailed Kite, besides the new species of the Lewis and Clark Expedition. It is certain that Wilson's accomplishments during his brief career as an ornithologist would have been greatly curtailed without the assistance of this great collection.

A perusal of the aforementioned Peale manuscript, which is sometimes briefly descriptive, often obtuse, but occasionally gives the im-

pression of superior discrimination, strengthens our belief that had he cared to publish the colored figures or a descriptive catalogue with original designations for his novelties, many of the new species now accredited to Vieillot, Wilson, and others, would have borne the name of Peale, even though it must be confessed that he had revealed no aptitude for technical names and descriptions.

The following extracts from his rough notes on some few species (headed by the names in current use and supplemented in some instances by confirmatory or explanatory notes) have peculiar interest as heretofore unpublished records of a very early American collector.

Sterna antillarum (Les.). A rare bird, it was blown from the seacoast across the Jerseys in a heavy storm, and dropped down in the street; we named it the Minute Tern.

Anhinga anhinga (Linn.). This was a straggler, shot at Elkridge Landing, high up the Patapsco River, (Maryland) far distant from where any were seen before. It differs in plumage from the other that was brought from Georgia. (Of this extraordinary species we can give little more than accurate descriptions and tolerably good portraits, which are taken from two fine specimens, admirably set up and preserved in the Museum of Mr. Peale, Nos. 3188 and 3189-Wilson. The Elkridge specimen has the record for being the farthest north on the Atlantic slope. Peale could scarcely be mistaken as to the exact locality since it was at no great distance from his native town.—F. L. B.).

Pelecanus erythrorhynchos (Gm.). This is one which was shot in the mouth of Chester Creek, Maryland. It is ascertained that they are found in the Chesepeake Bay; one, some years past, was taken as high as the Susquehannah. They seldom winter in our rivers although they are known every summer to be along the seacoast, especially of Egg Harbor. One was wounded up the Hudson as far as Albany some years ago.

Nyroca valisineria (Wils.). The Canvas-back duck is most esteemed for the table; a comparative view of the beak with that of the Red-head Duck (*A. rufa*) will confirm knowledge not easily mistaken, although the plumages of both species are very similar.

Camptorhynchus labradorius (Gm.). The Pied Duck deserves our notice as a rare duck, or not much known even to naturalists. They are sometimes brought to our market from Egg Harbor.

Oidemia americana (Sw.). The Scoter came from Sweden, differ from the American Scoter.

Erismatura jamaicensis rubida. The Ferrugenous Duck (*A. ferrugnea*) appears by authors to be a rare bird in Europe. This was shot on the Delaware, it is the only one I have seen. The purity of the blue of its bill while living, greatly surpassed its present appearance. (This very rare duck was shot some years on the River Delaware, and appears to be an entire new species. The specimen here figured, with the female that accompanied it, and which was killed in the same river, are the only individuals of the kind I ever met with. They are both preserved in the superb museum of my much respected friend, Mr. Peale, of this City.—Wilson).

Phoenicopterus ruber (Linn.). Flamingo. (*P. ruber*) inhabit Louisiana, the Bahama Islands, and the West Indies. It has a rather timerous than a lofty spirit. Both of these were living in our city for some time. Our climate is too severe to domesticate them.

Guara rubru (Linn.). Scarlet Ibis. (*T. ruber*) found in Georgia and South Carolina in summer. (One of them lived for some time in the museum of this city.—Wilson).

Grus americana (Linn.). Hooping Crane. (*G. americana*). (No. 3704. Dr. Mease has stated that this specimen came from the Capes of the Delaware).

Gallinago delicata (Ord). There is a snipe that is called the English Snipe. It is said to be found in every quarter of the globe under some trifling variety of plumage and size. The variety which we have here belonging to America, is considerable.

Numenius americanus (Bech.). There is a specific difference between the European (*arquata*) and the American Curlew, the under bill very much shorter on the latter in proportion to the birds; plumage of each species very much alike but the American Curlew is considerably larger than the European.

Charadrius semipalmatus (Bp.) or *C. meloda* (Ord). The Ring Plover (*C. hiaticula*) of Europe is very like a bird of which we have great numbers about Cape Henlopen.

Haematopus palliatus palliatus (Temm.). Singular is the genus *Haematopus* or Oystercatcher. They inhabit Europe and America. The darkest pair is from England, and the other from Cape May, called Sea-Pie, Pied Oystercatcher *H. Ostralegus.*

Tympanuchus cupido cupido (Linn.). Pinnated Grouse. They are numerous on the bushy plains of Long Island.

Meleagris gallopavo silvestris (Vieil.). So common a bird that it might be passed by without notice.

Ectopistes migratorius (Linn.). Migratory or Passenger Pigeon (*C. migratoria*). Visits Pennsylvania and all the middle states in prodigious flights—when our markets are supplied with vast quantities which are taken in nets.

Coragyps atratus atratus. The Carrion Crow. It is said not to go more than fifty or sixty miles from the seacoast of Carolina and Georgia. (The *Vultur atratus* of Bartram).

Elanoides forficatus (Linn.). Swallow-tailed Falcon. (A specimen now in the museum of Philadelphia, was shot within a few miles of that city.—Wilson).

Astur atricapillus atricapillus (Wils.). Black-cap Hawk. (Ash-colored or Black-capped Hawk. This bird was shot within a few miles of Philadelphia, and is now preserved, in good order, in Mr. Peales' museum.—Wilson).

Tyto alba pratincola. A great similarity of the common owl (*Flammea*) of Europe and Asia and one which is sometimes found in the vicinity of Philadelphia. The only difference between them, is the bars of the quill feathers; in all other parts of their plumage they are perfectly alike.

Asio wilsonianus (Less.). A variety of the Long Eared Owl.

Conuropsis carolinensis (Linn.). This is that small parrot with the Auora-colored head, named the Carolina Parrot. It sometimes breeds in that country, but most of them go farther south. They migrate to the western counties of Pennsylvania. (A number of these birds, in all their grades of progressive change from green to yellow, have been deposited in Mr. Peale's museum.—Wilson).

Coccyzus erythrophthalmus (Wils.). The Black Bill Cuckow is not described; beside the bill having none of the white on the under mandible, it is also without the pale rufous quill feathers of the Carolina (*C. americanus*); not very different from the Carolina but it is obvious that they are two separate species; pairs. (Peale exchanged on February 4, 1806, with other specimen, a Black-billed Cuckoo, to Savage of the New York Museum).

Campephilus principalis (Linn.). Ivory-billed Woodpecker. It is not found near Philadelphia, though it is said to inhabit from the Jerseys to Brazil.

Epidonax virescens (Vieil.). There is another species considerably like *fusca,* but a smaller bird, whose manners also resemble it. But this species are only found in the thickest woods, they visit us about one month later than the others, this bird has not been described. Mr. Wilson, a very accurate observer, fond of natural history, gave me this account. (Peale's description is inadequate and the reference may apply almost equally as well to *Myiochanes virens,* which is Bartram's *Muscicapa subviridus* the little olive col'd flycatcher).

Corvus corax principalis (Ridg.). Few of our citizens know that we possess the Raven (*Corvus corax*); it is rarely found near Philadelphia but abounds in the western parts of Pennsylvania.

Icterus spurius (Linn.). Before we leave this genus, it is deserving of notice that authors have been under the mistake of making the black-throat, the female of the Bastard Baltimore (*Oriolus spurius*). Here we see the proper mate to each of them. (Mr. Charles W. Peale, proprietor of the museum, in Philadelphia, who, as a practical naturalist, stands deservedly first in the first rank of American connoisseurs, and who has done more for the promotion of that sublime science than all our speculative theorists together, has expressed to me his perfect conviction of the changes in which these birds pass through; having himself examined them in spring and toward the latter part of summer, and having at the present time in his possession thirty or forty individuals of this species in every gradation of change.—Wilson).

Cassadix mexicanus major (Vieil.). Boat-tailed Grackle (*Gracula barita*). It is so-called because of the folding up of the tail feathers.

Loxia curvirostra pusilla Gloger. The American species we know has charming though not loud notes; they are rare on our seacoast but very numerous in the back parts of Pennsylvania. (The *Loxia rostra forficato* of Bartram).

Ammodramus savannarum australis Maynard. The Yellow-winged Sparrow is a nondescript; green shouldered sparrow; very few of our sparrows have been described by naturalists. (Evidently Peale considered the above named two distinct species. Wilson adopted the first for his common name for *Fringilla passerina*).

Spizella arborea arborea (Wils.). The Russet-capped Sparrow is most common. (The *Passer domesticus* of Bartram and the *Fringilla domesticus* Chipping Sparrow of Barton).

Melospiza melodia melodia (Wils.). Spotted-breasted Sparrow, nest and eggs, the male a fine singer. (The *Fringilla melodia* of Barton).

Piranga erythromelas (Vieil.). Red Tanager (*T. rubru*) is found generally throughout the United States.

P. rubra rubra (Linn.). *T. aestiva*, very few come so far north as Pennsylvania, breed in Maryland and winter near the Mississippi.

Bombycilla cedorum (Vieil.). Waxen Chatterer *A. garrulis* distinct from the American Cedarbird. (Those of our fellow citizens who have still doubts, and wish to examine for themselves, may see beautiful specimens of both birds in the superb collection of Mr. Charles W. Peale of Philadelphia, whose magnificent museum is indeed a national blessing, and will be a lasting honor to his memory. Wilson).

Lanius borealis (Vieil.). The largest of this genus of birds, is our Cinerous Shrike (*Lanius exubiter*).

Vireo flavifrons (Vieil.). Many of this genus of birds have a great part of their plumage of an olive colour but same have red eyes, therefore the English term is preferable. The White-eyed Flycatcher, this is, we consider a proper name for the same reason and it distinguishes it from another species of the same size, much like it except that it has a yellow throat.

Dendroica magnolia (Wils.). Black and Yellow Warbler, male and female; a nondescript. (Mr. Peale has the merit of having been the first to discover this elegant species, which he informs me, he found several years ago not many miles from Philadelphia.—Wilson). Peale identified the "Yellow Rump (*M. maculosa*) male and female" as the Myrtle Warbler.

D. cerulea (Wils.). Blue and White Warbler, also a nondescript, a beautiful bird, rare. (Except my friend Mr. Peale, I know of no other naturalist who seems to have hitherto known of its existence.—Wilson. The merit of having discovered this bird is entirely due to the Peale family, whose exertions have contributed so largely to extend the limits of natural history. The male, which he has accurately described and figured, was made known to Wilson by the late venerable Charles Willson Peale, who alone, and unassisted, accomplished an enterprise, in

the formation of the Philadelphia museum, that could hardly have been exceeded under the fostering hand of the most powerful government. To the no less zealous researches of Mr. Titian Peale, the discovery of the female is recently owing, who, moreover, evinced his sagacity by determining its affinities, and pointed out its true place in the system.—Bonaparte).

Seiurus motacilla (Vieil.). Louisiana Warbler *Ludovicina.*

Wilsonia pusilla pusilla (Wils.). No. 1703, with a black cap, a nondescript, very small.

Troglodytes aedon aedon (Vieil.). (Having seen no accurate description of this bird in any European publication, I have confined my references to Mr. Bartram and Mr. Peale.—Wilson. The *Motacilla domestica* House Wren of Bartram).

Telmatodytes palustris palustris (Wils.). Marsh Wren and its curious nest. (The *Passer palustris* of Bartram).

Hylocichla sp.? Little Thrush (*T. Minor*). They are generally found in the retired places of our woods and very often on the ground; common throughout the United States; here are some varieties of the same kind of Thrush. (Since *Turdus minor* was based in part upon both the Olive-backed and Wilson's Thrushes of Pennant and of Edwards, Peale's varieties doubtless included the Wood, Hermit, and possibly the Gray-cheeked Thrushes. Wilson, who clarified the sparrow muddle, was less successful with the thrushes).

Certhia familiaris americanus. Bp. The plain brown striped bird belongs to Europe, Asia, and America. The American species have the throat and breast whiter than those of Europe; we seldom see birds of the two Continents so much alike. (The *Certhia rufa* little brown variegated creeper of Bartram).

The Peales kept a great daybook or "Memoranda of the Philadelphia Museum", in which were recorded the enormous accessions of specimens through donation and exchange from 1803 to 1837. Alexander Wilson's first presentation occurred July 14, 1804, and consisted of sixteen birds' nests and eggs, and almost his last, March 20, 1813, was a set of Bald Eagle eggs taken at the Great Egg Harbor bay, now in the Brewer collection, Museum of Comparative Zoology. The itemization of the miscellaneous collection presented by Meriwether Lewis by order of President Jefferson covered several pages, and the Long collection was added March 23, 1821. It was the ambition of Peale to make his collections the nucleus of a National Museum, and with this end in view, he formed a national board of visitors; but government assistance was refused, and he retired from active management in 1808, his son Reubens became curator, and Rembrandt, probably a better painter than his father, had his studio in the east room on the first floor. There seemed at that time nothing incongruous in the exhibition of Revolutionary portraits and Nature's own creations in the "Cradle of Liberty", and Peale, a participant in the battles of Trenton, Princeton, Germantown, and Monmouth, would have been the last to desecrate it.

Catalogue No. 1, which by the way was not the only one so numbered and undated, summarized the collections as follows: portraits

130 (eventually increased to 269); wax figures of Indians, etc., 80; quadrupeds 190; birds 1240 (not including duplicates); tortoises 40; lizards 112; snakes 148; fishes 121; insects and miscellaneous, exceeding 6000; fossils and minerals 1920. It is highly improbable that much of importance was added to the ornithological department after the specimens collected by Titian R. Peale on the Long Expedition and his second trip to Florida; if so, it does not appear in the records of the museum.

Under the new management, which included Raphael, Rembrandt, Reubens, Linnaeus, Franklin, and Titian Peale, it was incorporated in 1821 and capitalized at $100,000. Previous to the municipal purchase of the Independence Hall, a project was actually under way to acquire the entire south side of the square, and Latrobe was employed to design a museum to cover the site.

Soon after the death of the elder Peale, February 22, 1827, the museum was moved to the Arcade on Chestnut Street above Sixth Street, and the capitalization increased to $400,000; later a museum was built on Sansom, from Ninth almost to Eighth Street, in 1838. It was a two-storied building 70 by 238 feet, with lofty ceilings, controlled by the Peale family and Pierce Butler. The museum no longer confined its sphere to the natural sciences and fine arts, for the mechanical genius of Franklin Peale had introduced the working models of American inventions; and there were numerous other features of the dime museum caliber.

The colorwork on the plates of the Harrison Hall edition of the "American Ornithology", published 1828-29, by some considered the best colored plates of all, was done by the Lawson sisters from specimens in the Philadelphia museum, presumably the types of the original edition.

The elder Peale had married three times and his children developed mostly as artists, only one of whom, his youngest son, elected to follow the profession of a naturalist. Titian Ramsey Peale (named after an elder half-brother, who showed great promise as a naturalist and who died in his eighteenth year) was born in the Hall of the American Philosophical Society in 1800. As a youth of seventeen years he accompanied Ord, Say, and Maclure on a brief, interrupted trip to Florida; he was assistant to Say on the Long Expedition to the West, 1819-20; he was employed by Bonaparte to collect in Florida and to draw many of the birds for the continuation of the "American Ornithology", 1824; and later, on the authority of a recent writer, he

is said to have accompanied the Burrough's Party to South America, 1831, of which little is known; he was also director and curator of the museum, and illustrator of Doughty's "Cabinet of Natural History and American Rural Sports", 1830-32.

It seems that Peale and Ord had planned a private collecting trip to the Missouri about 1830; but at that time the latter was in Paris studying the French language, and the trip was never accomplished. Nevertheless, it was not all work and no play. Titian returned from the Rocky Mountains an enthusiastic archer; and after reading up on the subject especially as conducted by the Royal Society of England, in 1836 with the help of his brother Franklin, Thomas Sully the artist, Dr. Robert E. Griffith, and other prominent business and professional men, organized the "United Bowmen", destined to endure for more than thirty years.

The regulation field costume, with its gold-laced Lincoln green coat, white pantaloons, black patent leather girdle and gold buckle, tassel and greasebox, and green covered straw hat turned up on the left side with three black ostrich plumes, must have put to shame the most gaudy parrot in his father's collection. The field meets were conducted every Saturday from May to October at Bush Hill, on the south side of Fairmount Avenue near Twentieth Street (where Alexander Wilson had found the Pine Siskin, *Spinus pinus*, about a quarter of a century earlier), and the target distances were not less than 60 and not more than 125 yards—a severe test of strength and marksmanship. The punch-bowl was not the useless piece of bric-a-brac it is today, although the "hailstorm" was partaken with discretion.

Titian Peale's great opportunity came with his appointment as mammalogist and ornithologist of the Wilkes' United States Exploring Expedition, 1838-42, mainly to lands touching the Pacific Ocean; his skill and experience as an animal painter, field collector, and preparator had secured the recommendation of his friends of the American Philosophical Society, though he had heretofore scarcely written a line for publication.

C. W. Peale had written on the very first page of his journal the following aphorism (or sophism?): "I love the study of nature because it teacheth benevolence".

Apparently, upon the return of Titian R. Peale after nearly four years of travel and successful endeavor, similar invidious influences and controversies that overwhelmed John Townsend, were reenacted in the instance of another gentle soul, for others were placed in charge of

Fig. 8. Titian Ramsey Peale.

his materials and he was hampered in many ways. Ord had reassured him: "I deeply deplore the plunder of your hard-earned treasures but it is precisely what I expected. Be of good cheer my dear old friend and fellow traveller. God almighty will not abandon you. Preserve your integrity and honorable bearing, and you shall yet succeed". Peale persevered, for under the date of May 19, 1845, he wrote his friend: "We are 'getting along' here after a fashion, much in need of books and countenance; the big gun of the Exploring exped. 'has gone off', and the echo is rumbling in the distance. I doubt much whether any ammunition will be forthcoming from small arms."

His official report, rather incongruously entitled "Mammalia and Ornithology", published in 1848, included the descriptions of numerous species of birds supposedly new to science, for he had no means of ascertaining that many had been described, owing to the lack of the essential works of reference. His inexperience in work of this nature counted heavily against him, for his contribution was deemed unworthy of the series in scientific value and was suppressed by Wilkes, who had retained command until the reports were completed. In 1852 the revised edition "Mammalogy and Ornithology", by John Cassin, appeared with Peale's folio volume of colored plates, denied the first edition. It is needless to state that Cassin through the liberality of a wealthy patron had the material and necessary works of reference and that the technical descriptions and synonmy were only matters of routine to that accomplished systematist.

Quite naturally Peale was mortified when his work was rejected and destroyed, though his friend George Ord advised him that since he had incurred the hostility of his superior, nothing could be done for his reputation unless he should publish at his own expense under copyright and submit judgment to the future. Nothing further was attempted and the Peale edition is one of the rarest books on ornithology.

Peale was frequently employed by Ord, presumably in the illustration of his contemplated work on the quadrupeds, a work that would have been a credit to all concerned had it been published, but it was discontinued upon a reverse in fortune of the author, and the drawings, descriptions, and some plates engraved by Lawson, probably destroyed after a few impressions of the plates were made. Peale also, at an earlier date began an illustrated work on the moths and butterflies engraved on stone, which he never finished.

In 1845 Ord was an applicant for the position of Secretary for the Board of Regents of the Smithsonian Institution, and he wrote Peale who was still in Washington, "Should the efforts of my friends be successful, you may take it for granted that the situation of Curator will be filled by T. R. P." Ord, through Colonel Biddle, with characteristic modesty, urged the appointment of Peale and thought his chances very good, though not so sanguine of his own, and when Prof. Henry was named, he expressed his entire approval. In 1848 Peale was made Assistant Examiner of Patents, later Principal Examiner in the Division of Fine Arts and Photography, in which congenial employment he continued until his resignation in 1873. He died in Philadelphia in 1885. His name is perpetuated in North American ornithology by *Falco peregrinus pealei*, a rather pathetic reminder of the Peales, father and son, whose integrity and perseverance had contributed so much to the material advancement of American ornithology.

The Museum Company failed as a commercial enterprise long after it had ceased to be the resort of the savants of natural science. Over-capitalization and the failure of the United States Bank closed its doors at the outbreak of the Mexican War. The natural history collections were sold to Kimball and Barnum in 1850, and a small part of the ornithological relics eventually found rest in the Museum of Comparative Zoology at Cambridge, Massachusetts—some fifty-three more or less doubtful types of Wilson, Ord, and Bonaparte, the sole survivors of the Ornithological Section, except two type specimens in the Academy of Natural Sciences of Philadelphia, and one of Wilson's types in the collection at Vassar College.

The national prominence of the old Philadelphia Museum in ornithology may be said to have extended from Rafinesque's first entry, throughout the activity of Wilson, and terminated with the visit of Bonaparte, a period almost coincident with its occupancy of Independence Hall. It then passed to the Academy for a time, but there was no immediate successor to Cassin, who tolerated neither rival nor neophyte; and the Smithsonian Institution came into its own.

Berwyn, Pa.

THE WILSON BULLETIN

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The present editorial organization is as follows: T. C. Stephens, Editor-in-Chief, Sioux City, Iowa; Myron H. Swenk, University of Nebraska, Lincoln, Nebraska; Albert F. Ganier, Nashville, Tennessee; Alfred M. Bailey, Chicago Academy of Sciences, Chicago, Illinois; R. D. Hissong, Sioux City, Iowa.

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EDITORIAL

THE NEW ORLEANS MEETING was a noteworthy one in many ways. Perhaps the setting and environment had much to do with its success. The total registration in the A. A. A. S. headquarters was 1,447, while at Cleveland last year the figure exceeded 2,700. While our own attendance at New Orleans fell below that of Cleveland, yet it made a much better relative showing than did the main registration, and compares favorably with the average of the preceding five years. The following figures present a statistical comparison of the Club's affairs during the past five years.

	Nashville 1927	Ann Arbor 1928	Des Moines 1929	Cleveland 1930	New Orleans 1931
Local attendance	32	31	106	41	11
Out of town attendance	43	75	96	122	81
Total attendance	75	106	202	163	92
Dinner attendance	46	50	77	98	35
Titles on program	34	24	36	33	27
Honorary members	4	4	9	7	7
Life members	....	....	5	7	7
Sustaining members	68	64	66	58	57
Active members	244	248	245	227	214
Associate members	347	383	397	479	461
Total membership	663	702	717	775	744
Total receipts	$1638	$1981	$2167	$2451	$2686
Pages in BULLETIN	256	274	272	312	334

As a basis for planning our future meetings the following meeting schedule of the A. A. A. S. will be of interest:

1932. Atlantic City, N. J.
1933. Boston, Mass.
1934. Pittsburgh, Pa.
1935. Havana, Cuba.
1936. Washington, D. C.
1937. Indianapolis, Ind.
1938. Atlanta or Houston.

The American Association plans to hold a summer meeting in Chicago in 1933 (June 19-30) during the World's Fair. Now that these dates have been fixed the W. O. C. may consider whether it wishes to join in this summer meeting at the World's Fair; if so, will a winter meeting in the same year be advisable? It is interesting to note that the American Association is planning to use $75,000 to bring to this meeting seventy-five scientists as guests from foreign countries.

The New Orleans meeting was productive of several changes in our official list. The officers and councillors were at this meeting elected under the new constitution which was adopted a year ago at Cleveland. Dr. Jesse M. Shaver, who has been Secretary for three years, was made President. His active and efficient work in the Secretary's office has placed the organization under deep obligation to him.

Professor E. L. Moseley, who was made First Vice President, has been, since 1914, the professor of Biology at Ohio State College, Bowling Green, Ohio. Besides being a member of various scientific societies, Prof. Moseley has written several books and numerous papers in various fields of biological science. He also has the honor of having named after him a fish, a bird, and a species of golden-rod. Prof. Moseley is also credited with having discovered the cause of a disease known as "the Trembles", or the milk sickness. He was a member of the Steere Scientific Expedition to the Philippine Islands in 1888.

Dr. Josselyn Van Tyne, who was elected Second Vice President, is now Curator of Birds in the Museum of Zoology of the University of Michigan. He is a graduate of Harvard University, received his Ph. D. from the University of Michigan in 1928, and remained there. He has worked out some excellent life history studies of birds at Barro Colorado Laboratory in Panama; and was ornithologist with the Kelley-Roosevelt Expedition to Indo-China in 1929, and also with the University of Michigan Expedition to British Honduras and Guatamala in 1931.

Our new Secretary, Mr. Lawrence E. Hicks, is a young man who was graduated from the Frederickstown High School in 1923. In 1928 he received the B. S. from Otterbein College, and in 1929 he received the M. S. from Ohio State University. He is now pursuing work for the Ph. D. while serving as instructor in the Department of Botany in the same university. He is a member of the Ohio Academy of Science, A. A. A. S., American Botanical Society, American Ecological Society, Wilson Ornithological Club, American Ornithologists' Union, Sigma Xi, and Gamma Alpha. His interest seems to be about equally divided between Botany and Ornithology, and he has done a splendid lot of research in both fields. He has accepted the heavy duties of his present office with enthusiasm, and we are certain that he will receive the cordial support of our members.

THE W. O. C. LIBRARY is in need of a book-plate. Members who are interested in such matters are invited to submit designs for a suitable book-plate for the books of the Club's Library. From those submitted a choice will be made and announced at a future time. No decision has been made, but it is probable that the book-plate should have a space for the accession number; and possibly also a space for the donor's name.

IT IS INTERESTING to note that the electrical devices which Mr. Baldwin has been using to determine the temperatures and the comings and goings of birds in the nest are now being placed in cribs to register the behavior of human babies.

GENERAL NOTES

Conducted by M. H. Swenk

A Snow Bunting Banded in Michigan Shot in Greenland.—A bird banding return came to me today (December 14, 1931) which gives me the following information: "You will be interested to know that information has been received to the effect that a Snow Bunting (which I) banded on February 17, 1931, was shot by R. Harring at Igdlorpait, Julianehaab District, Greenland, on April 30, 1931."—Oscar M. Byrens, *McMillan, Mich.*

The Barn Owl Nesting in Southeastern South Dakota.—A pair of Barn Owls (*Tyto alba pratincola*) nested by the James River near Yankton in the summer of 1931. I was out of town when the nest was found, about the middle of August. It was made a news item, containing a description of the young birds, and stating that no one knew whether they were eagles, hawks, or owls. Of course it was not difficult to decide between these. On September 17, the young birds were still in the nest. I have seen very few Barn Owls here, but am particularly surprised at their nesting so late in the season.—A. P. Larrabee, *Yankton College, Yankton, S. D.*

Red Crossbills at Viroqua, Wisconsin.—On August 6, 1931, I had the pleasure of having a small flock of Red Crossbills (*Loxia curvirostra pusilla*) come to the bird bath. Glancing from the window, two birds caught my attention as being different from the usual birds that frequent our small place. Out doors with my binoculars I was able to steal up to within about twenty feet. There were six, all in the bath at one time, fluttering and throwing the water about. They were quite unafraid and undisturbed by anything around them. It was easy to distinguish the crossed bills in the short time that they remained.—Margarette E. Morse, *Viroqua, Wis.*

Florida Gallinule Eats Goldfish.—On April 23, 1931, a live Florida Gallinule (*Gallinula chloropus cachinnans*) was brought to the Buffalo (New York) Museum of Sciences. It was given the run of the corridor in the preparator's department, and often jumped into an open aquarium, where it fed upon water plants. Four days after its capture it was observed to eat a dead goldfish which it flailed against the concrete floor before eating it. The bird became very tame and by April 29 it was greedily accepting bits of raw beef tossed to it from the distance of one foot. On the following day the bird took food from its owner's hands.—Louis B. Kalter, *Dayton, Ohio.*

A Spotted Sandpiper Incubates Five Eggs.—On June 28, 1931, while serving as a ranger naturalist in the Educational Division of the Department of Interior, at Old Faithful in Yellowstone Park, Wyoming, I found, along the bank of the Firehole River, a Spotted Sandpiper (*Actitis macularia*) on its nest. The nest was in an ideal location on the south side of the bank and sheltered by an overhanging tuft of sod.

Upon chasing the adult bird from the nest I found five spotted dark brown eggs. Five eggs are rather an exception to the rule. Most literature citations and records from observations show that the Spotted Sandpiper lays and incubates four eggs.

I visited the nest on each of the following three days, and it was empty on the third day, when the mother and young were nowhere to be found.—George A. Smith, *Brown University, Providence, R. I.*

A Red-bellied Woodpecker Robs a Sapsucker.—In December, 1927, I noted a Yellow-bellied Sapsucker (*Sphyrapicus varius varius*) on one of the sugar maple trees in our yard. He was busily engaged in drilling rows of holes around the larger limbs of the tree. I could see he had already constructed a large number of these miniature wells, which he toured from time to time. Each day he would come to the tree around 11:00 A. M. and would spend there from an hour and a half to two hours or more. One day as I was watching him make his rounds, he had a caller—a Red-bellied Woodpecker (*Centurus carolinus*). Immediately upon arrival the latter began to eat at the Sapsucker's holes. Indeed, he was hard to fill, and would fly at the Sapsucker, causing him to dodge around a limb in order to keep out of the way. Resentment seemed to be on the wrong side. The Sapsucker bore the intrusion patiently and without vociferation. Several times thereafter I saw the robber still working at his holdup game.—N. M. McGuire, *Nelson, Mo.*

Bank Swallows Killed by Automobiles.—On July 23, 1931, with Mr. and Mrs. J. H. Hollister, we noted ten or twelve dead Bank Swallows on a graveled road about a small lake about twenty-five miles southeast of Fargo. While driving near the same place on July 26 we found a group of fifty to one hundred birds on the telephone wires and about as many on the roadway. It was necessary to slow down to avoid striking them. Mr. and Mrs. W. E. Brentzel report that near Pelican Rapids, Minnesota, they saw on the same day large numbers of birds on dead trees, telephone wires, and on the road. In three places the roadway was black with dead birds, estimated at a total of 1,000. Both of these instances were on graveled roads on very warm days. The Brentzels state that large numbers of birds have been seen at this particular place in other years, but not the dead birds. A low meadow adjoins the road on one side and a farm house is located on the other, but there is no bank nearby.—O. A. Stevens, *Fargo, N. D.*

Some Brief Bird Notes from Indiana.—The *Aralia spinosa* berries are relished by Robins, Red-eyed Vireos, and other birds in the fall. The common Pokeberry is a source of great delight for Robins in the late fall. I have seen six Robins at one time feasting in one bush. Frozen apples that have been left on the tree are liked by many winter birds. Snow Buntings, which are very rare in this part of the country (I have known them to visit this place only once), feed upon weed seeds, even when the snow is very deep, and will jump upon a weed, breaking it down, and will then eagerly devour the seeds. Birds change their diet many times, according to the supply.

Robins almost all departed during August in 1930 and 1931, leaving but a few stragglers with us. I have travelled in eight other states during the time the Robins were the most plentiful, and find that in no place are there such a great number of these birds as in our own vicinity. I wonder why this is true? In many places for some reason we found few if any Robins. I think the Bluebirds are increasing in number in many places. Red-headed Woodpeckers are killed more than any other species of birds by autos, I think. I believe it is because they are clumsy and cannot get out of the way. The Yellow-breasted Chat is to be found in this part of the country often now, but formerly it was rare. It nests near this place, and I have made a thorough study of its habits, home and song, and find it a most interesting bird. It nests in wild cut-over areas that man seldom visits.—Mrs. Horace P. Cook, *Anderson, Ind.*

Worthington's Marsh Wren in the Vicinity of Savannah, Georgia.—Wheeler's paper on Marian's Marsh Wren in the December, 1931, issue of the WILSON BULLETIN makes it seem desirable to mention some facts about the local race of the Long-billed Marsh Wren breeding in this section.

Worthington's Marsh Wren (*Telmatodytes palustris griseus*) is one of the common birds near the Georgia-South Carolina line, on the coast and in its particular habitat. The type locality of the subspecies is given in the A. O. U. Check-List as Sapela Island (Georgia) some forty or more miles to the southward. To list the localities frequented by this species during the summer would take up too much space here, but along the Savannah River I have found it from the salt marshes on the coast to about two miles west of Savannah—a distance of about seventeen miles inland from the outer islands. This includes several miles of territory designated by Wayne (Birds of South Carolina) as the River Rice Fields. Here we find such fresh-water plants as the Pickerelweed (*Pontederia*), Arrowhead (*Sagittaria*) and various others. The birds nest here in tall reeds or marsh grass along the river banks, and the little drains and canals of the abandoned rice fields. The river water is either fresh or brackish, according as to the river is high or low.

Farther toward the coast they live and nest in high grass at the edges of the many waterways, as well as in the salt and brackish ponds of the coastal islands. I have never found one of their nests in a tree, and never in any place not directly over muddy shores or over water. The usual globular nest is made, and the materials vary according to the locality and convenience. Near the city docks fragments of cotton that have drifted across the river are woven into the nest with other suitable material.

The nesting time varies greatly, and if a second brood is raised, the birds must move well away from the first nesting site. I have found eggs in late April, and from then until July 24, though in different years. One colony located conveniently (for observation) in 1925 had many eggs through June and then an occasional set until late July. About three nests in eight have five eggs; that is one *occupied* nest, for many of the so-called "bachelor" nests are always to be found. I have not found a set that I believed to be complete with less than four eggs. The eggs are often covered with a soft cushion, and after incubation is started this cushion is usually drawn into the opening when the bird is absent.

It is not usual to find the eggs muddy, as with the clapper rails, the gallinules, and the seaside sparrows nesting in the same muddy marsh, which seems to indicate that the wrens do not descend to the mud, but travel along the grass stems and drifted sedge in search of food and nesting material.—IVAN R. TOMKINS, *Savannah, Ga.*

A Starling Roost in the Chicago Area.—The Starling (*Sturnus vulgaris*) is soon to be one of the common birds of the Middle West, if their rapid spread in the Chicago area is any indication. The first large roost in the region, so far as I know, is one at Homewood, Illinois. Mr. C. J. Albrecht reported to me that flock after flock of Starlings passed his house each evening, enroute to their resting places. On August 17, I saw a few of the birds, but was too late to witness the big flight, so we walked a couple of hundred yards from Mr. Albrecht's home, to that of Mr. Charles Harmke. The chatter of congregated birds was evident when we were 100 yards away, and we found great numbers of Starlings, Robins,

Grackles, English Sparrows, and a few Purple Martins swarming into the box-elders, cotonwoods, willows, and maples. Whenever we clapped our hands the birds would rise in flocks of twenty to one hundred. To be conservative, we estimated that there were 1,000 Starlings, but there were probably a great many more. Mr. Harmke said that the birds had been using the trees for their roosts for three years, and were such a nuisance with their filth that he believed he would destroy the trees.—ALFRED M. BAILEY, *Chicago, Ill.*

A Large Fall Migration of the White Pelican.—While riding around the south side of Crystal Lake, Dakota County, Nebraska, about 3:00 P. M. on October 4, 1931, my attention was called to a large flock of birds. At first we were undecided as to what they were. They were circling slowly, and as they came closer we decided that they were pelicans, and the size of the flock seemed to indicate the largest one of migrating pelicans that we had ever noticed.

There were four in the party and we tried counting them to form an estimate. They were widely scattered and we could count the small detached bunches. The count ranged from 700 to 1,200, and we compromised at 900. This flock was followed by several others. The one immediately following contained about half as many and four others followed in the next hour and a half, numbering from about 150 to 400. They were all flying slowly to the southeast, down the Missouri River Valley.

After watching these birds for some time we drove to the ranch house of Elmer Ebel, who has lived on this edge of the lake for thirty-three years, and is a close observer of waterfowl, being a conservationist as well as a hunter. He stated that this migration is not uncommon, in fact the pelicans are the first of the migrating birds to go south, and he has seen them in much greater numbers than on this occasion. The migration of these birds extends over a period of two weeks.

Mr. Ebel's father, the late Henry Ebel, lived on this land since 1868 and told the story that is also related by his son, of the pelicans alighting on this lake, spreading clear across it, and swimming along in one direction to some shallow place and apparently driving the fish to the shore, where they scooped them up with their great bills.

One week later, on October 11, 1931, Mr. Ebel reported a flock of eighteen pelicans resting on a sand-bar in the Missouri River, which is but a mile and a half distant from Crystal Lake.—W. R. FELTON, *Sioux City, Iowa.*

Notes on the Nesting of the Bronzed Grackle and Say's Phoebe.—In July, 1929, I watched several pairs of Bronzed Grackles (*Quiscalus quiscula aeneus*) attending to nesting duties, at Scranton, in southwestern North Dakota. The birds had built their nests on the steel beams inside of a large coal briquet plant, which was not in operation at the time. The grackles seemed much at home and resented our intrusion.

Several years ago I found the nest of a Say's Phoebe (*Sayornis sayus*), at Tuttle, South Dakota, about eighteen miles west of the Missouri River and near the North Dakota boundary line. The nest was placed over a window in an abandoned railroad station and contained four eggs at the time. Dr. W. J. Hoffman, Acting Surgeon, U. S. Army, observed a few Say's Phoebes in this region in 1873, while stationed at the Grand River Agency.—WILLIAM YOUNGWORTH, *Sioux City, Iowa.*

Some Notes on Birds for 1930.—The first migrant Nighthawk (*Chordeiles minor minor*) was seen August 25. From this date until the latter part of September several were seen every evening and from then on until October 13, flocks of hundreds were seen at dusk. Of late years the main fall migration route has been a little to the east. The spring route is unknown.

The fall migration was very marked in the entire absence of the Hermit Thrush (*Hylocichla guttata faxoni*) and a few only of the Olive-backed Thrush (*Hylocihla ustulata swainsoni*) on September 1 to 3. Both generally are common migrants and stay several weeks.

On September 18 there was a migration of female Rose-breasted Grosbeaks (*Hedymeles ludovicianus*) that continued for a couple of days.

On September 23, there was a migration of Catbirds (*Dumetella carolinensis*) that continued for two weeks. This was the first time that I have ever noticed an increase in the species during migration.

Instead of the usual increase in Cardinals (*Richmondena cardinalis cardinalis*) during the winter season, there was a marked decrease, very few remaining here this winter.—Katie M. Roads, *Hillsboro, Ohio.*

Influence of an Osprey on Bronzed Grackles and Pied-billed Grebes.—On September 26, 1931, while the writer was watching three Pied-billed Grebes (*Podilymbus podiceps podiceps*) on the artificial lake in Glen Helen, Antioch College campus, Yellow Springs, Ohio, an Osprey (*Pandion haliaetus carolinensis*) flew over the water. At the time there were six to eight hundred Bronzed Grackles (*Quiscalus quiscula aeneus*) in the oaks along the east side of the four-acre lake. About one-third of these pursued the Osprey which circled the lake twice before "climbing" higher into the air where the wind was much stronger. I believe that the grackles became discouraged and quit the pursuit because of the stronger velocity of the chill wind at the higher altitude. Before the grackles saw the Osprey they were comparatively quiet. For a half hour after the pursuit of the Osprey began and ended they kept up a veritable din by their noisy "squeaking". As soon as the Osprey was gone I looked for the grebes. They had swum inshore and were taking cover in a small patch of half-submerged rushes, where they remained for twenty minutes or more. Previous to the Osprey's appearance they had been feeding, probably on fresh-water snails, in the clearer water near the entrance of the stream which fills the lake.—Louis B. Kalter, *Dayton, Ohio.*

Notes on the Feeding of the Least Bittern.—On September 5, 1931, a Least Bittern (*Ixobrychus exilis*) stood on the edge of the mud at the margin of the shallow water of an upper pool of a water supply reservoir in Butler County, Pennsylvania, where water plants and cat-tails grow in islands and clumps. When first seen, it was standing very still with the head drawn in toward the body somewhat, and the long bill parallel to the water surface. As I watched, it slowly raised one foot and put it down in the water with extreme care. There was almost no ripple on the water as the bird advanced for about eighteen inches, making no movement except that of the feet. Then the head and neck shot forward, the bill pierced the surface of the water and a four-inch fish was captured by the bill grabbing it in the center of the body. The bittern turned toward the shore and walked rapidly out of the water holding the bill with the fish pointing skyward. On shore, the fish was eaten while the tail feathers of the bird wiggled very much like the wagging of the tail of a contented dog.—Sidney K. Eastwood, *Pittsburgh, Pa.*

Recent Bird Notes from Southern South Dakota.—On July 7, 1931, the writer had occasion to spend the day in Yankton County, South Dakota, a distance of about sixty-five miles northwest from Sioux City, Iowa. The following notes taken there are thought worthy of mention. A male Rocky Mountain Grosbeak (*Hedymeles melanocephalus papago*) was seen carrying food, and was no doubt a breeding bird. This must be about the extreme eastern limit of this western grosbeak. The Western Blue Grosbeak (*Guiraca caerulea interfusa*) was not uncommon in suitable habitats. Several Rock Wrens (*Salpinctes obsoletus obsoletus*) were also seen and heard along the cliffs, on which hundreds of Cliff Swallows (*Petrochelidon lunifrons lunifrons*) had plastered their nests. An interesting overlapping of breeding ranges was also found. The Eastern Towhee (*Pipilo erythropthalmus erythropthalmus*) was found breeding, and the more western form, the Arctic Towhee (*Pipilo maculatus arcticus*), was also not uncommon. The call notes of the latter bird are very distinct from those of the eastern form. The Ovenbird (*Seiurus aurocapillus*) was found along the Missouri River bottoms, and on the uplands the families of the Lark Sparrow (*Chondestes grammacus* subsp.) were already forming into flocks of forty or fifty birds.—WILLIAM YOUNGWORTH, *Sioux City, Iowa.*

A Large Flock of Wood Ibises in Harrison County, Iowa.—On the morning of September 9, 1931, while I was approaching the village of Mondamin, Harrison County, Iowa, from the south, I saw a flock of at least two hundred Wood Ibises (*Mycteria americana*), which had apparently just taken flight from along the Missouri River. The exact site where the birds were first seen was one-half mile from the village. They rose in two groups, which later joined to form the one large flock. As they wheeled about in great circles, rising apparently to gain the advantage of a strong wind, they made a spectacular and beautiful display, with brilliant white breasts flashing light in unison as the birds turned again and again. I had a splendid opportunity to observe them through glasses, and at reasonable range, and even tried to secure a photograph by getting into a position in advance of the flock, but in so doing the birds were lost from sight. They were last seen wheeling about very high in the air and traveling northeastward, about five miles northeast of Mondamin. I was surprised to encounter these birds, with which I have been familiar in Florida, under tthe circumstances mentioned. I believe this is the first Iowa record of the species.—WALLACE B. GRANGE, *U. S. Biological Survey, Washington, D. C.*

White-breasted Nuthatches Occupy a Nest Box.—For the past twenty years I have been interested in attracting birds to nest boxes at my farm near Atlantic, Iowa. In that time Flickers, Red-headed Woodpeckers, Screech Owls, Sparrow Hawks, Bluebirds, Chickadees, House Wrens and Purple Martins have reared their families in boxes which I have put up for them. In another location a pair of Crested Flycatchers did likewise. The past summer (1931) added another box nester to the list, the White-breasted Nuthatch, which is common in my grove.

The box used by the nuthatch was similar to those put up for woodpeckers, as described in the book, "Birds of the Wild", and was really intended for the Downy Woodpecker. The box was placed about ten feet from the ground and nailed to the side of an elm tree near the garage. The entrance hole was about an inch in diameter, and the cavity of the box was about four and one-half

inches square by ten inches deep, as nearly as I recall. There was a small amount of ground cork placed in the bottom of the cavity, a substance that I have always used when trying to attract woodpeckers.—FRANK C. PELLETT, *Hamilton, Ill.*

The Red-Cockaded Woodpecker in Grundy County, Tennessee.—On August 8, 1931, Mr. Eugene Odum of Chapel Hill, North Carolina, and I took a trip to Beersheba, Tennessee, in the Cumberland Mountains, to see if the Duck Hawks and Golden Eagles were in that vicinity during the late summer.

While walking along the bluffs, which overlook the deep gorge of Roaring Fork, and which are covered with pines, spruces and second growth hardwoods, we heard some unusual bird calls at a point about half way between Beersheba and Stone Door Cliff. These calls seemed to come from woodpeckers or nuthatches, but were quite different from any calls either of us had ever heard before. The birds resembled Hairy Woodpeckers save for stripes across their backs and the noisy calls which parents and three young kept making constantly. Being uncertain as to their identity, we waited until our return to Nashville for a decision. The size, color, calls, habits, and habitats proved them to be the Red-cockaded Woodpeckers (*Dryobates borealis*), a species new to both of us.

Further investigation shows that Dr. Harry Fortner of the University of Tennessee reported them to Mr. A. F. Ganier some six or eight years ago from Beersheba; that Mr. S. N. Rhoads found them in 1895 near Jamestown, Tennessee, in a similar habitat; and also that Fox took a specimen at Rockwood, Tennessee, April 4, 1884. Since these are the only records for this species in Tennessee it is evident that *Dryobates borealis* is a very rare bird in this latitude west of the Alleghanies.—GEORGE R. MAYFIELD, *Nashville, Tenn.*

The Red-headed Woodpecker as a Mouser.—The streets past my home are paved with smooth unbroken concrete slabs, twenty-four feet wide, with a curbstone six inches high at the sides. Just across the street is a school grove consisting of many fine old shade trees. Robins, Blue Jays, Red-headed Woodpeckers, and several other species make their home in this grove.

On the afternoon of July 28, 1931, I noticed a mouse (*Mus domesticus*) running on the pavement. What could have caused this little creature to come out in broad daylight and parade on the pavement I could not tell, but it had not gone very far when a Red-headed Woodpecker (*Melanerpes erythrocephalus*) darted down out of the grove and made an attack upon it. The woodpecker struck the mouse several hard and vicious blows with its stout bill, rolling and tossing it over and over. It appeared that a moment more of such treatment must have finished the mouse, had not a vehicle approached just at that instant, threatening to crush both the red-head and its prey. The bird darted away just in time to save itself, and the mouse, not having been struck by the wheels, hurriedly limped to the edge of the pavement, got over the curb with difficulty, and hid in the grass. The red-head flew back immediately to see what had become of its prospect for dinner, but the mouse was so well hidden that the bird had to give up the chase.

This bird is somewhat erratic in its migrations, but is usually to be found here in fair numbers in the summer time. Ordinarily it catches and devours great numbers of cicadas, June-beetles, grasshoppers, dragonflies, and many other insects, both large and small, but although I have carefully observed it for many years, I had never before seen it attack a rodent.—E. D. NAUMAN, *Sigourney, Iowa.*

The Blue-Gray Gnatcatcher in Indiana.—I noticed in the WILSON BULLETIN for September, 1931, p. 230, that Margaret L. Weir of Hawarden, Iowa, says concerning the Blue-gray Gnatcatcher (*Polioptila caerulea caerulea*) that she found its nest hanging in the fork of a branch some twenty-six feet over the sidewalk. I have had some experience with this interesting bird, but it had a very different nest from the one she described. I did not know the Blue-gray Gnatcatcher ever built anything except the one kind of nest, and that one similar to but larger than the nest of the Ruby-throated Hummingbird. A nest that we found this summer was on top of a dead limb of a tree, where the branch forked with one above the other, and this nest was built upon the lower branch so that the other fork was a sort of a protection over the nest.

When we first noticed the bird it was fighting two Hairy Woodpeckers which were in the same tree. Then it flew immediately to the nest with an insect or worm for the young, making it easy to see the nest. We watched for some time, noting how suitably the nest was placed and how well it was built. It was about twenty feet from the ground near the river in Mounds State Park, which is about three miles from this place. A few days later we returned to the place to find the three young birds out in the tree, begging for food and following the parents about to be fed. Later we went to try to get the nest and found that it had disappeared. We hunted for it on the ground but it was gone. It was perfectly made and about four inches deep, covered with lichens. Several pairs of these tiny birds were in the same park during the summer, indicating they were nesting thereabouts.—MRS. HORACE P. COOK, *Anderson, Ind.*

Unusual Nesting Site of Chimney Swifts.—April 1, 1930, found me badly in need of some Senega Snakeroot (*Polygala senega*) plants, a plant bearing a root that is much used in medicine, so early that morning I set forth with a companion in quest of some. We finally found some on a southern hillside overlooking the rocky, winding stream of Bullfork, a small creek northeast of my home. But we did not work long, for a sudden rain forced us to seek shelter. About a quarter of a mile from us on the opposite side of the hill was an old unused log house, and my companion and I hastened to reach it before we became wet, but as the rain gained steadily in volume we were forced to give up the idea of collecting more plants.

We ate our lunch, and, becoming tired of inactivity, began to explore the old house. The ceiling was little higher than the height of an average man, and the attic was reached through a square hole cut in one corner of the ceiling. I climbed through this, and after becoming accustomed to the poor light, the first thing I noted was a row of seven nests of the Chimney Swift (*Chaetura pelagica*) plastered to the southern wall, about three feet beneath the comb. The three middle nests were built complete to the last stick, but two nests on either side of the completed three were but half finished. The nests were straight in line, spaced almost alike. I should say that they averaged about eight inches apart. Cracks in the walls of the attic allowed about half light to enter, but the only way that the swifts could have entered was through one eight-inch tile set in the roof, a tile that had once served as a "collar" for a stove pipe that had come from a stove in the lower room through a hole in the attic floor, and then through the tile in the roof to the outside.

I wondered if one pair of swifts had built the seven nests, and went back later in the spring to see if I could learn, but some one had partly demolished the

old building so, of course, the swifts were not there. However, a pair of Phoebes (*Sayornis phoebe*) were using a nest that I had seen on my first trip, a many-storied nest above the north window of the downstairs room.—GRANT HENDERSON, *Greensburg, Ind.*

Some Observations on the Eastern Willet at Nesting Time.—The nest of the Eastern Willet (*Catoptrophorus semipalmatus semipalmatus*), its notes and migrations, have been quite well covered, but little seems to have been written about the nesting habits and period of incubation.

I had the opportunity during April and part of May, 1931, to spend a part of the time along a sandy fill where these birds nest abundantly, but unluckily had to leave before completing the season with them. The Long Island Fill and the connected Oysterbed Island are in the neighborhood of the Georgia-South Carolina state line, and on the north side of the Savannah River, near the entrance, and looking out toward Callibogue Sound and the open sea. The willets feed on the extensive mudflats and nest in the thick Bermuda grass on the higher sandy ground.

The nests show the individuality of the pair, though always scanty as nests go, as sometimes eggs are laid on the ground and very little grass is added during the incubation. Others prepare a nest before laying the eggs, and while some use dry grasses only, others include some green material. In all, eleven nests were logged and visited from day to day as eggs were added. No attempt was made to set up a blind near the nests. The presence of the birds was noted with reference to the time of day, and of tides, and it was found that the eggs were seldom uncovered for more than a few minutes at a time, after incubation had commenced, which was as soon as the last egg was laid. One exception to this concerned a nest which could be found uncovered quite often, and it later seemed that only one bird was caring for the hatching. Whether this was a case of desertion or accident, of course cannot be told, but if this nest alone had been relied on, some very different, and erroneous conclusions might have been reached.

Both birds incubate. They change at quite frequent intervals, though flushing the bird from the nest may have been the reason. To determine this, a small swab covered with prussian blue in oil, in once case, and with smeary maroon paint in another, was placed in the nest. One pair appeared with maroon paint on the wing of one and the belly of the other. The second pair had one unmarked bird, and one with a large blue area underneath. Several times I flushed one bird, and a half hour later found its mate on the eggs. The feeding grounds are so near that usually both birds are near, or within call.

In a couple of cases the birds would allow close approach, before leaving the eggs. One, in particular, would sometimes stay until I parted the grasses directly overhead. The eggs are laid at one or two day intervals, varying with different pairs, and until the full clutch is laid are not covered at all times. The temperature and protective coloring probably makes covering unnecessary.

After leaving the vicinity, I made a trip back, and found two young birds in the nest. The clutch had been completed on May 6 or 7, and this was the 30th, which gives an incubation period of twenty-three or twenty-four days. These two young had been hatched not much over an hour, yet one persisted in trying to crawl into the surrounding grass. The young birds are seldom seen from the time of hatching until the flight feathers are partly grown, when they begin picking up food along the sand and the mudflat edges.

After the nesting season the willets are shy and retiring, not nearly so conspicuous as the yellowlegs, until the next spring, when they become one of the noisiest birds of this locality, often crying all night long, as well as in the day.

During the winter months there are a few Western Willets (*Catoptrophorus semipalmatus inornatus*) mixed with the few Eastern Willets present. I have never been able to identify them in the field, but the larger size and longer bill of the western bird is plainly apparent when in the hand.

The willets of this coast have certainly been increasing during the last few years, for where there were two or three pairs in 1923, now there are at least twenty pairs. On April 26, 1931, a few miles to the southward, a flock of twenty migrating birds was seen. At this time most of the locally breeding birds were already mated.—IVAN R. TOMKINS, *Savannah, Ga.*

Additional Bird Records for South Dakota.—The manuscript for Bulletin No. 9, Birds of South Dakota, passed from the authors to the Department of Publications of the University of South Dakota during the winter of 1916. Due to the stress of the war period and to lack of funds, it was not published until March, 1921. The authors had no control over these circumstances, and during this interval did not have access to the manuscript. But from 1916 to the present we have made many corrections and revisions, and have added twenty-nine species and subspecies to the former list.

It seems necessary because of lack of authentic records to eliminate Bonaparte's Gull and the Greater Snow Goose from the list, leaving a total of 320 in the old list, or, with the new additions, a total of 349 species and subspecies for the state. It is not practicable to publish a new, revised edition at this time, hence we are submitting the new records. The University Museum has acted as a clearing house, and is grateful to the many observers over the state for assistance rendered in keeping the records, as far as known, up to date.

American Egret (*Casmerodius albus egretta*). A straggler. Authentically identified on June 4, 1929, by W. F. Kubichek, of Coe College at Cedar Rapids, Iowa. This bird was with a colony of Black-crowned Night Herons on a wooded island in Rush Lake, Day County. (See note by Youngworth, WILSON BULLETIN, XLIII, December, 1931, p. 309).

Little Blue Heron (*Florida caerulea caerulea*). A straggler. One seen by W. H. Over and H. Rice in Clay County, June 11, 1921. Later seen by L. G. Atherton of Flandreau.

White Ibis (*Guara alba*). An old record, of about 1890, but one was repeatedly seen during that summer at a small lake in the northern part of Clay County by Dr. G. S. Agersborg and Fred Heglin. Dr. Agersborg was the first resident bird student of note in South Dakota, and published a list of birds of Clay and Yankton Counties in the *Auk* in 1885.

White-winged Scoter (*Melanitta deglandi*). Rare in migration. Taken on Lake Madison, Lake County, by J. C. Green of Sioux Falls. Specimen now in the University Museum.

White-rumped Sandpiper (*Pisobia fuscicollis*). Fairly common in migration. Specimens taken in Sanborn County are in the Museum.

Western Sandpiper (*Ereunetes maurii*). Common some years in migration. Skins are in the Museum that were taken in Lyman County, April 13, 1928, by Walter Thietje.

Red Phalarope (*Phalaropus fulicarius*). Fairly common in migration up the eastern side of the state. Skins in the Museum.

Broad-tailed Hummingbird (*Selasphorus platycercus platycercus*). In "Birds of the Northwest", by Elliott Coues (1874), two records are mentioned for the Black Hills. Mr. C. H. Holden, a correspondent of Dr. Coues, reports a nest. Its range is probably on the western slope of the Hills, but the writers have never seen a specimen in the Black Hills.

Northern Crested Flycatcher (*Myiarchus crinitus boreus*). Reported as nesting in Yankton County by Dr. A. P. Larrabee of Yankton College, and in Minnehaha County by C. J. Stringham, who sent the hollow limb and nest to the Museum.

Acadian Flycatcher (*Empidonax virescens*). Reported by T. C. Stephens for June 2, 1918, in "A Preliminary List for Union County" in the Proceedings of the Iowa Academy of Science, XXV. Minnehaha County, 1920, C. J. Stringham. Probably nests sparingly in the southeast corner of the state.

Hoyt's Horned Lark (*Otocoris alpestris hoyti*). Probably our most common winter visitor.

Rocky Mountain Nuthatch (*Sitta carolinensis nelsoni*). Listed from Elk Creek, Black Hills, under the name of Slender-billed Nuthatch (*S. c. aculeata*), by George Bird Grinnell (Report of a Reconnaissance of the Black Hills, by William Ludlow, Captain of Engineers, U. S. Army, Washington, D. C., 1875), prior to the separation of *nelsoni* as a subspecies distinct from *S. c. aculeata* of the west coast region.

Carolina Wren (*Thryothorus ludovicianus ludovicianus*). A straggler. Yankton County, 1929, A. P. Larrabee.

Blue-gray Gnatcatcher (*Polioptila caerulea caerulea*). Minnehaha County, 1920, C. J. Stringham. Faulk County, 1924, Mrs. C. M. Norton. Probably a rare summer resident as it has nested across the Big Sioux River at Hawarden, Iowa, 1931. See the report by Margaret L. Weir in the Wilson Bulletin, Vol. XLIII, 1931, page 230.

Yellow-throated Vireo (*Vireo flavifrons*). A migrant. Yankton County, 1921, A. P. Larrabee of Yankton College.

Blue-headed Vireo (*Vireo solitarius solitarius*). Minnehaha County, 1920, C. J. Stringham. Yankton County, 1921, A. P. Larrabee.

Prothonotary Warbler (*Protonotaria citrea*). A migrant. Clay County, May 22, 1926, E. P. Churchill and W. H. Over. Union County, May 12, 1929, W. F. Kubichek.

Northern Parula Warbler (*Compsothlypis americana pusilla*). A migrant. Minnehaha County, 1920, C. J. Stringham. Yankton County, 1921, A. P. Larrabee.

Cape May Warbler (*Dendroica tigrina*). A migrant. Clay County, May 17, 1920, W. H. Over and W. M. Davidson, and many times later.

Black-throated Blue Warbler (*Dendroica caerulescens caerulescens*). A migrant. Minnehaha County, 1920, C. J. Stringham, A. Schaeffer, Adrian Larson. Faulk County, Mrs. C. M. Norton.

Cerulean Warbler (*Dendroica cerulea*). A migrant. Minnehaha County, 1920, C. J. Stringham. Faulk County, Mrs. C. M. Norton .

Black-throated Green Warbler (*Dendroica virens virens*). A migrant. Union County, 1931, William Youngworth (see the WILSON BULLETIN, XLIII, No. 3, p. 223).

Northern Pine Warbler (*Dendroica pinus pinus*). Dr. Charles E. McChesney (Notes on the Birds of Fort Sisseton, Dakota Territory, United States Geological Survey, Bulletin No. 5) reports as follows for this species: "Is seen in small numbers only, from May 22 until about the first of June each year; does not breed on the *Coteau des Prairies* to my knowledge."

Connecticut Warbler (*Oporornis agilis*). A migrant. Minnehaha County, 1921, C. J. Stringham. Spink County, 1931, J. F. Brenckle.

Canada Warbler (*Wilsonia canadensis*). Dr. Charles E. McChesney (Notes on the Birds of Fort Sisseton, Dakota Territory) says: "This warbler arrives by the 22nd of May, and is seen in some numbers for a few days, but appears to depart by the 1st of June, as I have never observed it after that date."

Gray-crowned Rosy Finch (*Leucosticte tephrocotis tephrocotis*). Frequent winter visitor in the Black Hills. W. H. Over, November, 1921. Often fed during the winter by W. J. Sharwood of Deadwood, Laurence County.

Hepburn's Rosy Finch (*Leucosticte tephrocotis littoralis*). Stragglers have been seen with the typical form of the species during the winter in the Black Hills by W. J. Sharwood of Deadwood, Laurence County.

Bendire's Crossbill (*Loxia curvirostra bendirei*). Black Hills, October 16, 1903, Merritt Cary. McPherson County, July 29, 1931, Clarence Cottam of the United States Biological Survey. (See the WILSON BULLETIN, XLIII, 1931, page 311, "Some New Bird Records for South Dakota", by Mr. Cottam).

Swamp Sparrow (*Melospiza georgiana*). A summer resident. In the list of birds seen, Lieutenant G. K. Warren (A Preliminary Report of Explorations in Nebraska and Dakota, by F. V. Hayden; War Department Annual Report for 1858) records the Swamp Sparrow from the mouth of the Vermilion River (now Clay County) in 1857. Specimens in the Museum taken by F. A. Patton in Sandborn County in 1921.—WILLIAM H. OVER and CRAIG S. THOMS, *Vermilion, S. D.*

PROCEEDINGS OF WILSON ORNITHOLOGICAL CLUB

By Jesse M. Shaver, Former Secretary

The Eighteenth Annual Meeting of the Wilson Ornithological Club was held at New Orleans, Louisiana, on December 26-29, 1931, in connection with the general sessions of the American Association for the Advancement of Science. Saturday and Sunday (December 26 and 27), the Wilson Club made an excursion to Avery Island for the purpose of studying water birds. Here, Honorable E. A. McIlhenny entertained in true southern fashion. It was a memorable trip, especially for our members from the north. Each one will long remember the view of Snowy Egrets coming to roost in the marsh at twilight. There also remains the remembrance of a kindly, portly gentleman who, as our host, taught us the real meaning of southern hospitality. It is thus that we remember E. A. McIlhenny.

Monday and the morning of Tuesday were given to the reading of papers by our members and to a brief business meeting. These meetings were held in Gibson Hall, Tulane University.

Since President Stack was absent due to illness, Secretary Shaver called the meeting to order and called for nominations for a temporary chairman. Lynds Jones was elected and presided over the rest of the sessions.

Tuesday afternoon was given over to the presentation of moving pictures with some business being considered. The Annual Dinner was held on Tuesday evening, December 29, in the Evangeline Room of Hotel De Soto (our headquarters hotel).

Business Sessions

The business sessions were held on Monday from 9:20 to 10:00 A. M., and interspersed between the moving pictures of Tuesday afternoon's session.

At the Monday morning business meeting, the minutes of the previous meeting were approved without being read, since they had previously been published in the Wilson Bulletin (Vol. XLIII, No. 1, pages 66-86). The Secretary's report was regarded as satisfactory under existing financial conditions. It showed a total membership of 756 with 131 delinquent members. The Editor reported on a number of details touching the Wilson Bulletin. Exact figures on subscribers and exchanges were not given since the report was given extemporaneously. The full report of the Editor as well as that of the other officers will be found in this number of the Bulletin. The Treasurer's report was read, in the absence of the Treasurer, by T. C. Stephens. It was referred to the Auditing Committee for consideration. All new members temporarily elected by the Electoral Board were approved. T. C. Stephens read the report of F. P. Allen, Librarian, bringing up certain matters pertaining to the Library of the Wilson Ornithological Club. On motion made by A. F. Ganier, seconded, and passed, these matters were referred to the Executive Council for consideration and action. Lynds Jones made a report supplementary to that of the Library Committee indicating that a sample reproduction of an out-of-print number of the Wilson Bulletin had been made at a cost of $18.75. A motion to authorize the Treasurer to pay this amount was unanimously passed. The temporary committees appointed at this time were: the Committee on Nominations, the Committee on Resolutions, and the Auditing Committee.

The Committee on Nominations was composed of Mrs. H. J. Taylor, T. C. Stephens, and Paul R. Elliott. The Committee on Resolutions was composed of

A. F. Ganier, Glenn W. Bell, and Fannye Cook. Josselyn Van Tyne and W. D. Johnson were appointed on the Auditing Committee.

At the Tuesday afternoon session, all committees reported.

The report of the Committee on Nominations was accepted and, on motion, the Secretary was instructed to cast one ballot for the slate. The new officers thus elected were:

President: Jesse M. Shaver, George Peabody College for Teachers, Nashville, Tennessee.

First Vice-President: E. L. Moseley, State Teachers College, Bowling Green, Ohio.

Second Vice-President: Josselyn Van Tyne, University of Michigan, Ann Arbor, Michigan.

Secretary: Lawrence E. Hicks, Ohio State University, Columbus, Ohio.

Treasurer: W. M. Rosene, Ogden, Iowa.

Councillors:

A. F. Ganier, Nashville, Tennessee.

Lynds Jones, Oberlin, Ohio.

Myron H. Swenk, University of Nebraska, Lincoln, Nebraska.

The Committee on Resolutions made the following report which was unanimously adopted:

Resolved, The Wilson Ornithological Club, assembled for its eighteenth annual meeting at New Orleans, Louisiana, this 29th day of December, 1931, wishes to record its thanks and appreciation to:

Tulane University, for the use of its buildings and equipment, so well adapted to our meetings;

To our fellow-member, Edward Avery McIlhenny, for his courtesies and hospitality in entertaining the Club at New Iberia and on his estate at Avery Island, to view the unique plant life of the locality and the large assemblage of water and other birds wintering there;

To our local members and constituents in the New Orleans district, who by their interest and assistance, have helped to make this meeting a success;

To our efficient officers, particularly to Secretary Shaver, Editor Stephens, and Treasurer Rosene, who by so generously giving of their time and interest to the Club, have enabled it to continue the high standards set in the past.

Whereas, our National Bird, the Bald Eagle, has become so rare within the interior of our country that its complete extermination is threatened and that

Whereas, those which reside upon our seacoasts subsist almost entirely upon fish and therefore do little or no harm to the property of man, therefore be it

Resolved, that The Wilson Ornithological Club earnestly advocates that legislation be enacted which will bring about the complete protection of the Bald Eagle within the United States.

Whereas, The Wilson Ornithological Club is interested in the conservation of all forms of wild life;

And Whereas, The Protective laws for grizzly and brown bears of Alaska have been largely removed; *And Whereas*, they are in danger of extermination due to encroachment of industry, including the Paper Pulp Mills proposed for Admiralty and Chicagof Islands:

And Whereas, these Islands have, it is estimated, over half the grizzly and brown bear population of Alaska; be it

Resolved, that the Biological Survey and the Alaska Game Commission reenact adequate protective laws for the Alaska bears generally; and be it further

Resolved, that the Admiralty and Chicagof Islands be established as permanent preserves or national parks for the protection of the Alaska grizzly bears; be it further

Resolved, that copies of this Resolution be sent to Members of Congress, The Biological Survey, The Alaska Game Commission, and Special Senate Committee on wild life resources.

The Auditing Committee reported that the Treasurer's accounts were well kept, accurate, and balanced. The Committee's report was accepted and the Treasurer's report approved.

At the close of the Tuesday afternoon program, the Acting President, Lynds Jones, declared the meeting adjourned.

Social Features

The entertainment of the Club at Avery Island by Mr. E. A. McIlhenny was by far the outstanding social event of the meeting. Mr. McIllhenny is a most gracious host who plans everything for the comfort of his guests, even to the minutest detail.

The Annual Dinner was held Tuesday evening, December 29, in the Evangeline Room of the DeSoto Hotel. The dinner was a great success in every way. An attractive menu was served. Dr. John McBryde of Tulane University, served as Toastmaster, introducing each of the speakers in his usual charming manner. The following toasts were on the program:

Looking Backwards. Lynds Jones.

Looking Forwards. Mrs. H. J. Taylor.

The Wilson Bulletin. T. C. Stephens.

A Backward Glance at the History of the National Association of Audubon Societies. T. Gilbert Pearson.

At noon on both Monday and Tuesday, the members had the pleasure of lunching together in the dining room in Gibson Hall.

Exhibits

No special exhibits were arranged for this meeting of the Wilson Ornithological Club. However, Mr. Hopkins of the Louisiana State Department of Conservation, kindly invited our members to visit the Conservation Museum where many interesting exhibits were arranged. Mr. Frank Carroll also kindly invited members to visit his own personal collections.

Program of Papers

The program is given below just as it was carried out, which varies slightly from the order in which it was announced in the program printed for the meeting.

Monday Morning, December 28, 1931

Mr. Stanley C. Arthur welcomed the Wilson Club to New Orleans in a few well-chosen words. The response on behalf of the Club was made by Dr. Lynds Jones.

1. Observations from a Ninety by Two Hundred and Eight Foot Town Lot. Mrs. Elizabeth Allen Satterthwait, Webster Groves, Mo.

   Over a period of thirteen years, with sometimes a break of several weeks' absence from home, bird observations have been made from an improved city lot, 90′x208′, in Webster Groves, Missouri, and 102 species and varieties have been recorded. Observations have been made of a few unusual species, in-

cluding the European Tree Sparrow (found in the United States only in the vicinity of St. Louis). Six different thrushes have been banded, and notes made regarding the banding, feeding and measuring of approximately forty species.

2. Notes on the Birds of the Campus of The Berry School for Boys. (Lantern.) Glenn W. Bell, The Berry School for Boys, Mount Berry, Ga.

This study was carried on from September 6, until May 6, in each of the school years of 1928-1929, 1929-1930, and 1930-1931, respectively. The study was made at different intervals during the day. In the spring time, the early morning was chosen for the study of the nesting activities of the birds.

A feeding station attracted many birds. Over a thousand individual birds were captured and banded with the United States Biological Survey bands. In addition to the aluminum bands, colored celluloid bands were used on a few birds. Notes were kept on the various birds seen on the campus.

Maps were made of the campus, and each bird's nest was indicated on the maps. There were few nests destroyed. Bluebird nests increased when nesting boxes were provided. There were about the same number of the other birds nesting on the campus during each of the three years. In many cases the nests were near the nesting sites of the preceding year.

3. Ornithological Exploration in British Honduras. (Lantern.) Josselyn Van Tyne, University of Michigan, Ann Arbor, Michigan.

The speaker gave an account of the work of an expedition from the University of Michigan Museum of Zoology which in February and March, 1931, penetrated to the little known "Southern Pine Ridge" south of El Cayo, British Honduras. The "Pine Ridge" is an area of savannah and pine forest very similar in appearance to those of Georgia and Florida. Although at 17° N. latitude and an altitude of less than fifteen hundred feet, the pine forest is sharply demarked from the surrounding rain-forest jungle and has a very distinctive avifauna. Characteristic birds of the pine ridge were *Balanosphyra, formicivora, Myiochanes pertinax, Pionus senilis, Dendroica graciae, Aimophila rufescens,* and an hitherto undescribed vireo.

4. The Relation of Temperature and Relative Humidity to the Time of Ending of the Evening Song of Birds. (Lantern.) Paul R. Elliott, Richard Hardy Memorial School, Richard City, Tenn.

This paper is a report of a study made at Nashville, Tennesse, over a period of 147 consecutive days in the spring and summer of 1930, to determine any existing relations between temperature or relative humidity and the time at which the various birds stopped their evening songs. It was found that temperature was highly significant in the case of the Mockingbird, only. Relative humidity was of slight importance, not even being very significant with the Yellow-billed Cuckoo.

5. A Brief Survey of the Bird Life of Baldwin County, Ala. Helen M. Edwards (Mrs. W. H.), Fairhope, Ala.

A brief summary of the outstanding points of interest in the bird life of Baldwin County, Alabama, pointing out the differences between conditions that are found to exist and those that would be expected by a visitor from some other region. No attempt is made to give a complete faunal list, and only those species are named whose occurrence seems to be of particular interest.

6. Nesting of the Golden Eagle in Tennessee. (Lantern.) A. F. Ganier, Nashville, Tenn.

A résumé of the present status of the Golden Eagle in the Southern Appalachians with particular reference to its occurrence at the breeding season in several places in the mountains of Tennessee. An occupied nest, which was discovered in the spring of 1931, was depicted by a number of views.

7. Pioneers in Kansas Ornithology. (Mrs. H. J.) Rose S. Taylor, Berkeley, Cal.

F. H. Snow and Colonel N. S. Goss are pioneers in Kansas Ornithology. Snow's work began when he was called to the University of Kansas which opened its doors September, 1866. Snow's interest in birds continued throughout his life. He published several catalogues of the birds of Kansas. His duties as Professor of the Natural Sciences and later as Chancellor did not allow any one field to absorb him.

Colonel N. S. Goss was an ornithologist from his youth up. He came to Kansas in 1857. He was a successful business man and when he had made a comfortable fortune he devoted his entire time to ornithology. He traveled widely to know birds. He was one of the original members of the A. O. U. and never failed to attend its meetings. His large collection of birds—all his own mounting—he gave to the state in 1881. His book, *History of Birds of Kansas* is the summing up of his life work.

8. The Conservation Policy of the National Association of Audubon Societies. (Lantern.) T. Gilbert Pearson, National Association of Audubon Societies, New York City.

A brief survey of some of the important activities of the National Association of Audubon Societies both in America and foreign countries was presented.

9. The Rhythmical Ending of the Robin's Evening Song in Relation to the Nesting Cycle. (Lantern.) Joe Young West, Baird, Miss. Read, in the absence of the author, by J. M. Shaver.

By means of the Macbeth Illuminometer records were kept of the light intensity in foot candles at the ending of the Robin's evening song during the first two periods of the nesting season (February 17 to June 11, 1931). Records of physiological activities of individual pairs of birds were kept. The data indicate that there is no definite rhythm in the light intensity at the time of the ending of the last evening song of individual Robins in relation to the nesting season. Physiological changes in male Robins relating to the nesting cycle do not influence this specific reaction to light. There is great irregularity in variation of light intensity in foot candles at the ending of the last evening song and this variation is greatest during the establishment of territory.

10. Curvature of Wing and Soaring Flight. (Lantern.) W. B. Taber, Jr., Kansas, Illinois. Read, in the absence of the author, by T. C. Stephens.

This paper explains the mechanics of soaring flight. It is the explanation of the effect of the curvature of the under surface of birds' wings in changing the direction of air currents, thereby producing the forces necessary to overcome gravity and to thrust the bird forward.

11. The Contribution of the Zoöphile to Science. Mrs. Charles Noel Edge, New York City.

Mrs. Edge pointed out the distinctive contribution of scientists who write popular books and papers well, to the advancement of ornithology. The nature-lover may arouse interest in worth-while activities.

12. Observations on the Nesting of the Blue-gray Gnatcatcher. Mrs. Margaret Morse Nice, Columbus, Ohio. Read, in the absence of the author, by Miss Fannye Cook.

The male Blue-gray Gnatcatcher does not sing to proclaim his territory: perhaps the *spee* which is constantly given by both birds serves this purpose. Both male and female labor equally at nest building; during incubation they relieve each other at short intervals (15 to 40 minutes); they carry tiny insects to the young, one by one at a rapid rate. Intense activity and close coöperation between the pair are characteristic of this species.

13. The Relation of Song to the Nesting Season of Birds. (Lantern.) Glenn W. Bell, The Berry School for Boys, Mount Berry, Ga.

This is a study of the relation of song, especially the early morning song, to the progress of the nesting season of birds, in particular that of the Brown Thrasher, Mockingbird, Cardinal, Wood Thrush, Chipping Sparrow, Pine Warbler, and Mourning Dove. The study was carried on from the time the birds began to sing in the spring, until May 6 in each of three years: 1929, 1930, 1931, respectively, on the campus of the Mount Berry School for Boys, Mount Berry, Georgia. The early morning, from the time the birds began to sing until after sun-up, was chosen for the daily period of study. Some additional observations were frequently made during the day, such as: finding nests, locating territories, and observing the general activities of the birds.

The amount and intensity of song was recorded and compared with the nesting activities of the individual bird. Nesting activities seemed to retard the early morning song. When incubation begins, the song is retarded in all species. In most cases, no song was heard early in the morning after incubation began. Therefore, there appears to be a gradual decrease of song as nesting activities progress.

14. The Egg-Laying Cycle of the Mourning Dove. (Lantern.) L. J. Cole, University of Wisconsin, Madison, Wis.

This paper reports the egg-production record of a captive Mourning Dove during five seasons. Most of the time she has been mated with a male Mourning Dove but in 1928 was mated to a domesticated Ring Dove. Her production in the different laying periods has been as follows.

1927:	May 9 to July 25,	16 eggs in	77 days
1928:	March 11 to August 2,	19 eggs in	143 days
1929:	April 19 to August 6,	28 eggs in	108 days
1930:	April 26 to August 16,	24 eggs in	111 days
1931:	April 13 to August 3,	23 eggs in	117 days
Total		110 eggs in	556 days

Fertility with Mourning Dove mate has been good. Eggs were transferred to other birds to hatch and rear. Variability in egg size shows little relation to season, but the second egg of a clutch is usually larger than the first. The sex-ratio for 62 young is 45.2% males (28 males to 34 females). Sex-ratio for first eggs of clutches is 50% males to 50% females; of second eggs, 39% males to 61% females.

15. The Nesting Habits and Growth of the Black Skimmer (*Rynchops nigra*). Frank M. Carroll, New Orleans, La.

Specimens of eggs and all stages from newly-hatched young to adult were shown. Beginning with a description of the adult bird, the various habits and characteristics were outlined after which their method of nesting was considered. The process of incubation was explained and illustrated with embryological specimens. The growth of the chick to maturity was described.

16. Temperature Laws and Life Zones. (Lantern.) S. Charles Kendeigh, The Baldwin Bird Research Laboratory and Western Reserve University, Cleveland, Ohio.

Merriam's Temperature Laws, formulated in 1894, and accepted by many ornithologists, may be criticized upon the following basis: (1) Temperatures at other seasons of the year than the breeding period are important; (2) The mere cartographic agreement between isotherms and boundaries of life zones is without particular significance; (3) The statistical data upon which Merriam based his arguments were incorrectly compiled; (4) The method which was used in summing temperatures is without physiological basis or practical application; and (5) Other phases of temperature or other factors aside from temperature may be the more important.

Experimental studies performed at the Baldwin Research Laboratory indicate that temperature, relative length of day and night, and food supply are

all correlated factors of considerable importance in controlling the distribution, migration, and abundance of birds.

In so far as the life-zone concept is based upon Merriam's Temperature Laws, it is unacceptable. For this concept to survive, it must be based upon the actual distribution of the birds.

17. The Failure of the System in Ecological Work. V. E. Shelford, University of Illinois, Urbana, Ill.

The failure of temperature summing in relation to the development of invertebrates and the lack of accord between life zones and ecological phenomena was stressed. Lack of agreement between communities and life zones was pointed out.

18. Nesting Waterbirds of South Dakota. (16 mm. motion pictures.) W. H. Over, University of South Dakota, Vermillion, S. D.

Interesting moving pictures of the varied water bird life of the lakes of this ornithologically interesting state.

19. Observations on Migrations of Blue Geese and Double-crested Cormorants. (Lantern.) W. F. Kubichek, Coe College, Cedar Rapids, Iowa.

Observations on the migrations of the Double-crested Cormorants, with a chart showing recoveries of bands placed on the birds at Waubay Lake, S. D. Notes on the migration of Blue Geese with special reference to the concentration during the spring migration in the Coteau region of South Dakota

20. The Blue Goose at Avery Island. (35 mm. moving pictures.) E. A. McIlhenny. Avery Island, La.

Showing the almost unbelieveable numbers of Blue Geese concentrated on the Louisiana coast during the winter months.

21. Methods of Bird Study. (35 mm. moving pictures.) S. Prentiss Baldwin and S. Charles Kendeigh, The Baldwin Bird Research Laboratory, Cleveland, Ohio.

Bird-study at the Baldwin Bird Research Laboratory consists of research into the development, life-history, physiology, and ecology of birds. These motion pictures show some of the methods and instruments used in this study.

The growth of the embryo within the shell is the object of special study with the microscope, and motion pictures of this continuous development are being made. Other studies deal with the development of specific gravity of the bird with the expansion of the lungs and air-sacs.

Special interest attaches to the study of body temperatures and the resistance of birds to low and high air temperatures, as this may throw new light on the problem of bird migration, distribution, and abundance.

The temperature of the bird in the nest is obtained, without the bird's awareness, by means of long thermocouples and electrical temperature-recording devices. Other instruments record every visit of the bird to the nest to incubate the eggs or feed the young.

Such studies are yielding much of new interest in the field of ornithological research.

22. The Pelican. (35 mm. motion pictures.) Stanley C. Arthur, New Orleans, La.

The nesting of the Brown Pelican on certain mangrove-overgrown islands at the mouth of the Mississippi River was depicted. The interesting story of the Pelican on the seal of state of Louisiana was revealed also.

23. The Terns at Bird Key, Tortugas Islands, Florida. (35 mm. moving pictures.) J. Paul Visscher, Western Reserve University, Cleveland, Ohio.

Fascinating views of the Noddy and Sooty Terns of Bird Key—made famous by the homing studies of Watson.

24. Feathered Fishers of Our Southland Swamps. (35 mm. moving pictures.) H. L. Stoddard, U. S. Biological Survey, Washington, D. C.

Marvelous pictures of the Egrets, Herons, Wood Ibis, etc., of southern swamps.

25. The Herons and Egrets of Louisiana. (35 mm. moving pictures.) E. A. McIlhenny, Avery Island, Louisiana.

Excellent pictures of the nesting water birds at Avery Island including wonderful views of a nesting colony of Snowy Egrets, and an early film used to combat plume hunting.

26. Present Status of the Nesting Warblers of Tennessee. (Read by Title.) George R. Mayfield, Vanderbilt University, Nashville, Tenn.

This paper discusses the present status of seventeen species of warblers nesting in middle Tennessee and that of five other species nesting in other parts of the state. Four species seem to be on the increase; six seem to be decreasing in numbers; and twelve species are holding their ground. In numbers they range from abundant as in the case of the Maryland Yellowthroat and the chat to rare as in the case of the Swainson's and the Golden-winged Warbler. The Blackburnian Warbler has not been found in Tennessee by any member of the Tennessee Ornithological Society, though reported by earlier observers in Tennessee and in similar habitats in North Carolina. The earliest dates of arrival during the past five years and the latest dates of departure were also given. Records relied on were those of the author with some reference to the lists of others.

27. Sketch: Rim Rock and Solitaire. (Read by Title.) Rev. P. B. Peabody, Topeka, Kans.

A brief survey of the topography of Weston and Crook Counties, Wyoming; of forests; of the psychology of Townsend's Solitaire during the autumn, the winter, and the breeding season. Descriptions of nests, nesting places, and an outstanding set of eggs were given, illustrated by splendid photographs.

REPORT OF THE LIBRARIAN FOR 1931

Ann Arbor, Michigan, December 15, 1931.

I have the honor to present herewith the first report of the Librarian of the Wilson Ornithological Club at the end of the first year of the library's existence.

HOUSING. The library is housed in a section of the ornithological library of the Museum of Zoology in the new University Museums Building in Ann Arbor. It is shelved apart from the ornithological collection and kept as a distinct and separate entity.

DONORS. The Librarian takes pleasure in acknowledging gifts to the Club library from the following:

Mr. Ralph Beebe, Lincoln Park, Michigan.
Mr. Stuart T. Danforth, Porto Rico.
Mr. Ralph E. DeLury, Ottawa, Canada.
Emergency Conservation Committee, New York City.
Mr. Herbert Friedmann, Washington, D. C.
Mr. Lynds Jones, Oberlin, Ohio.
Mrs. F. H. King, Madison, Wisconsin.
Mr. Frank C. Pellett, Hamilton, Illinois.
Mr. John McB. Robertson, Buena Park, California.
Mr. T. C. Stephens, Sioux City, Iowa.
Mr. O. A. Stevens, Fargo, North Dakota.
Mr. E. L. Sumner, Jr., Berkeley, California.
Mr. J. Van Tyne, Ann Arbor, Michigan.

The gifts total 54 bound volumes and 750 separates, many of which are reprints.

EXCHANGES. With the establishment of the Research Library of the Wilson Ornithological Club the matter of adding to the facilities of the library by the deposition in it of exchanges becomes important. There such serials will be available to all members of the Club. The exchange of the BULLETIN for not only domestic but also foreign journals will be of inestimable scientific value to the Club in the field of research. In this field the exchanges may quite naturally become the very backbone of the research library .

REPRINTING. The reprinting of out-of-print numbers of the BULLETIN is a matter of great importance to the welfare of the Club, and especially to its library. A program of reprinting should be worked out which will eventually make available complete sets of the BULLETIN at least from the beginning of the New Series (1894). This will benefit the Club in many ways. A complete set of the BULLETINS will aid in facilitating exchanges. It will be much easier to secure a complete set of another society's publications if we have a complete set of our own to offer in return. It will also be of service to the members of the society who are anxious to complete their own sets. There are, doubtless, many members of the Club who have lacunae in their own sets which they have long been waiting to fill. The financial return to the Club from the sale of complete sets should be a considerable item. It should in itself make the matter of reprinting most expedient.

STOCK. Dr. Lynds Jones has deposited in the University Museums the entire stock of BULLETINS beginning with No. 1 (1894), which is a reprint, to Vol. 36, No. 4 (December, 1924), which is the last number now available in Ann Arbor, the reserve supply from 1925 to date being in Sioux City, Iowa. The supply of BULLETINS is housed in the University Museums Building in the fireproof stock room for publications, in dust-proof cases. They are arranged chronologically and labeled. In the Librarian's room there is a card file of the BULLETINS where a separate card may be found for each number, indicating the number of copies available.

The Librarian feels that a definite policy should be adopted in regard to the extent of the supply of BULLETINS to be kept on hand. A reserve stock of twenty-five numbers should be kept, from which numbers may be taken only to form complete sets. In other words, a number of the BULLETIN must be declared to be unavailable when there are but twenty-five copies on the shelves, unless a whole set of the BULLETIN is being ordered.

PRICE. The Librarian suggests that a decided increase in the price of back numbers of the BULLETIN be put into effect at once. A minimum price of fifty cents per number is recommended. Some of the early numbers should be sold for not less than one dollar each. The Librarian will be glad to furnish a list of such numbers. It is the custom in many scientific societies to give members of the society the privilege to purchase their society publications at a twenty per cent discount. I recommend this practice to the W. O. C. The Librarian suggests that in each issue of the BULLETIN a notice be inserted stating what BULLETINS are for sale and the price thereof.

BOOK PLATE. As yet no book plate has been provided by the Club for its books. This should receive the serious attention of the Club.

Respectfully submitted,

F. P. ALLEN,

Librarian, Wilson Ornithological Club and University Museums.

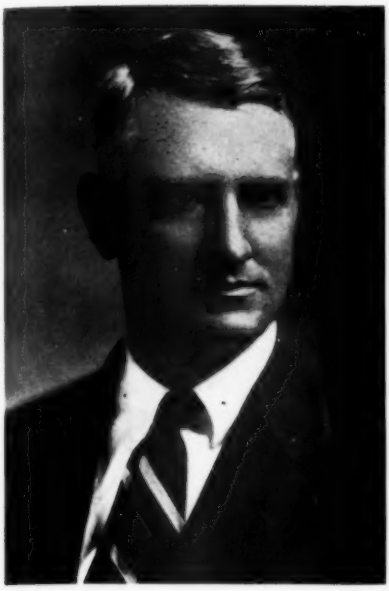

FIG. 9. J. M. Shaver
President

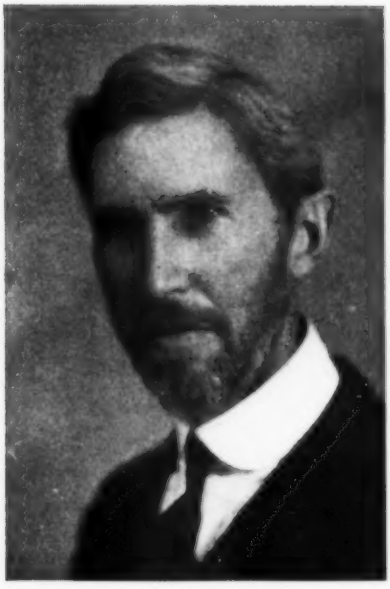

FIG. 10. E. L. Moseley
First Vice-President

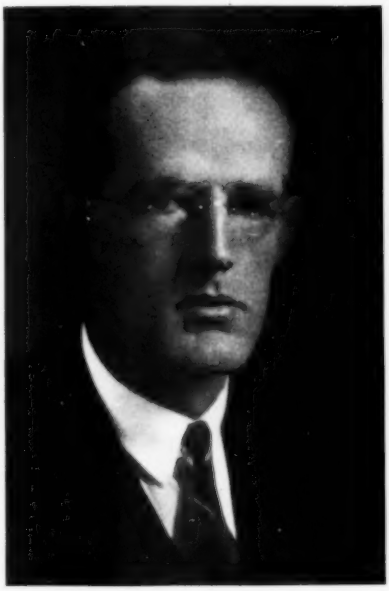

FIG. 11. J. Van Tyne
Second Vice-President

FIG. 12. L. E. Hicks
Secretary

Fig. 13. Group at the Annual Meeting, New Orleans, 1931.

REPORT OF THE SECRETARY FOR 1931*

Nashville, Tennessee, December 28, 1931.

To the Officers and Members of the Wilson Ornithological Club:

During the past year, the intensive campaign for new members was continued with even more energy than in 1930, but with results that were not up to the high mark of last year. Altogether about 5,000 circular letters and 2,000 personal letters were sent out from the Secretary's office with only 162 new members secured as compared with 241 last year. These new members were distributed among the different classes as follows: Sustaining, 5; Active, 18; Associate, 139. Although this seems to be a very small per cent of success in solicitation, it should be kept in mind that many of these were follow-up letters after a previous unsuccessful solicitation in 1930, and that many of the letters went to people connected with schools and museums who did not subscribe personally but sent in subscriptions in the name of the school or museum. For instance, all of the members of the Cooper Ornithological Club were re-solicited this year. Shortly afterwards there was a noticeable increase in the number of institutional subscribers from California. In considering this report, it is necessary to remember also the unusual financial conditions of 1931.

At present, the Club has the following paid-up memberships: Honorary Members, 7; Life Members, 7†; Sustaining Members, 57; Active Members, 214; Associate Members, 461; total, 744. Last year the total membership was 776 (which erroneously included eleven members who had earlier resigned). So in spite of the 150 new members secured this year, the Club has suffered a net loss of 24 members distributed as follows: Honorary Members, 0; Life Members, 0; Sustaining Members, 0; Active Members, 10; Associate Members, 14.

Although all records were checked in 1930 by the Editor, Secretary, and Treasurer, it was discovered this year that eleven people were still on the Secretary's roll, that had been delinquent for their dues for from one to three years. These names have been removed and it is now felt that the Secretary's records are correct.

At the time of the last annual report, there were 54 members delinquent for dues. Ten of these members paid and were reinstated while the rest (44) were dropped from our rolls.

It is with much regret that the list of 1931 delinquent members is announced. There is a total of 137 members delinquent for 1931 dues. These are distributed as follows: Sustaining Members, 8; Active Members, 21; Associate Members, 108.

JESSE M. SHAVER, *Secretary.*

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*Revised to the end of December, 1931.

†Two of the Life Members are also Honorary Members.

KEY TO GROUP PHOTOGRAPH. 1, Lynds Jones. 2, Jesse M. Shaver. 3, T. C. Stephens. 4, Mrs. W. H. Edwards. 5, Mrs. A. F. Satterthwait. 6, Mrs. Lynds Jones. 7, A. W. Meyer. 8, Mrs. W. S. Randall. 9, H. C. Bryant. 10, Josselyn Van Tyne. 11, Mrs. H. J. Taylor. 12, S. Charles Kendeigh. 13, W. F. Kubichek. 14, Fannye Cook. 15, Frank Carroll. 16, G. B. Claycomb. 17, Charles V. Robinette. 18, T. Gilbert Pearson. 19, Mrs. G. B. Claycomb. 20, Glenn W. Bell. 21, Paul A. Stewart. 22, Albert Ganier. 23, E. L. Moseley. 24, Paul R. Elliott. 25, Lony Strabala. 26, Kenneth Edwards. 27, J. Paul Visscher. 28, W. H. Over. 29, O. P. Allert. 30, W. D. Johnson. 31, Chas. J. Spiker. 32, Duncan McIntosh. 33, F. A. Harris. 34, Richard H. Wade. 35, Ethel B. Finster. 36, Mrs. O. P. Allert. Photographs of this group, 8x10 inches, may be secured at $1 each from John N. Teunisson, 1525 Eighth Street, New Orleans, La.

REPORT OF THE TREASURER FOR 1931

From December 19, 1930 to December 21, 1931

Receipts for 1931

December 19, 1930, Balance on hand as per last report		$ 675.15
The following was collected from members and subscribers:		
6 Associate Members for 1930	$ 9.00	
3 Active Members for 1930	7.50	
388 Associate Members for 1931	582.00	
197 Active Members for 1931	492.50	
55 Sustaining Members for 1931	275.00	
93 Associate Members for 1932	139.50	
44 Active Members for 1932	110.00	
14 Sustaining Members for 1932	70.00	
5 Associate Members for 1933	7.50	
1 Active Member for 1933	2.50	
From membership dues		1,695.50
99 Subscribers for 1931	148.50	
35 Subscribers for 1932	52.50	
1 Active Subscriber for 1931	2.50	
13 Foreign Subscribers	24.06	
5 Fractional Subscriptions	5.79	
From subscriptions		233.35
Received for back numbers sold	23.00	
Received various contributions	7.10	
Received from Mrs. H. J. Taylor	50.00	
Received Trust refund	1.00	
Received membership list sold	1.00	
Miscellaneous receipts		82.10
Total receipts		$2,686.10

DISBURSEMENTS FOR 1931
(Condensed Form)

Printing four issues of the BULLETIN	$1,366.50	
Other expenses in Editor's office	135.85	
Halftones, engravings, cuts, etc	143.49	
Publication costs		$1,645.84
Expense in Secretary's office	249.64	
Expense in Treasurer's office	41.73	
Dr. Stephens for excess remittance	10.00	
Five fractional subscription refunds	5.75	
Arizona University check returned	1.50	
Exchange on foreign checks	.63	
Running expenses		309.25
Total disbursements		$1,955.09
December 21, 1931, Balance on hand		731.01
Total		$2,686.10

(A complete itemized list of expenses is attached)

ENDOWMENT FUND

December 19, 1930, Balance on hand in Endowment Fund (See last annual report)	$888.35
Received interest on Endowment Fund at 4% (Savings department of City State Bank, Ogden, Iowa)	35.88
December 21, 1931, Balance on hand in Endowment Fund	$924.23

Respectfully submitted,

(Signed) W. M. ROSENE, *Treasurer.*

Register of the Attendance at the New Orleans Meeting

From Alabama: Thomas S. van Aller, Mobile; Kenneth Edwards, Mrs. W. H. Edwards, and Duncan McIntosh, Fairhope; P. H. Lodier, Newbie; H. E. Wheeler, Birmingham. From California: Mrs. H. J. Taylor, Berkeley. From District of Columbia: H. C. Bryant, Washington. From Florida: Grace E. Baker, Tallahassee; Mr. and Mrs .C. C. Goff, Leesburg; T. R. Robinson, Terraleia; C. H. Willoughby, Gainsville. From Georgia: Glenn W. Bell, Mount Berry; Mrs. E. F. B. Cobb, Atlanta; Mr. and Mrs. Marvin C. Quillian, Macon. From Illinois: Victor E. Shelford, Urbana. From Indiana: W. S. Blatchley, Indianapolis; M. S. Markle, Richmond. From Iowa: Mr. and Mrs. O. P. Allert, McGregor; F. A. Harris and Chas. J. Spiker, New Hampton; Mr. and Mrs. W. F. Kubichek, and Mr. and Mrs. A. W. Meyer, Cedar Rapids; T. C. Stephens, Sioux City. From New Orleans: Stanley C. Arthur, Mrs. E. A. Bechtel, Frank M. Carroll, Miner B. Conger, James W. Edwards, A. W. Harrison, E. S. Hopkins, Harnett T. Kane, William Letter, Buford M. Meyers, Jr., Richard H. Wade. From Louisiana outside of New Orleans: H. J. Chatterton, Mr. and Mrs. G. B. Claycomb, Lafayette; Mildred Dunn, K. S. Foote, J. R. Fowler, Baton Rouge; and W. D. Johnson, and Grace Sharp, Shreveport. From Massachusetts: Mabel E. Bowman, Cohasset. From Michigan: Josselyn Van Tyne, Ann Arbor. From Mississippi: Fannye A. Cook, Crystal Springs; P. E. Collom, McComb; Mr. and Mrs. John M. Frazier, Hattiesburg. From Missouri: Louise Becker, and Helen Dykeman, St. Louis; Mr. and Mrs. A. F. Satterthwait, Webster Groves. From New York: Mrs. Charles Noel Edge, Peter Edge, and T. Gilbert Pearson, New York City. From Nebraska: Robert H. Wolcott, Lincoln. From North Carolina: Ethel B. Finster, Ashville; A. Shaftesbury, Greensboro; Mr. and Mrs. J. M. Vallentine, Chapel Hill. From Ohio: Mary C. Crone, S. Charles Kendeigh, J. Paul Visscher, Cleveland; Lawrence E. Hicks, and Robert H. McCormick, Columbus; Dr. and Mrs. Lynds Jones, Oberlin; C. Mae McAdow, Peebles; E. L. Moseley, Bowling Green; William A. Rice, Delaware; Paul A. Stewart, and Lony B. Strabala, Leetonia; Allan H. Watkins, Chardon. From Oklahoma: Mrs. W. S. Randall, Oklahoma City; J. L. Selb, Tahlequah. From South Dakota: W. H. Over, Vermillion. From Tennessee: Paul R. Elliott, Richard City; A. F. Ganier, and Jesse M. Shaver, Nashville. From Texas: Don O. Baird, Huntsville; Homer R. Bolen, and Otto Mackensen, Austin; J. J. Carroll, Houston; R. T. Hartley, Beaumont. From Wisconsin: L. J. Cole, and R. J. Barlen, Madison.

Summary of Attendance

Alabama, 6; California, 1; District of Columbia, 1; Florida, 5; Georgia, 4; Illinois, 1; Indiana, 2; Iowa, 9; Louisiana (outside of New Orleans), 8; New Orleans, 11; Massachusetts, 1; Michigan, 1; Mississippi, 4; Missouri, 4; Nebraska, 1; New York, 3; North Carolina, 4; Ohio, 13; Oklahoma, 2; South Dakota, 1; Tennessee, 3; Texas, 5; Wisconsin, 2. Total attendance, 92. Total outside of New Orleans, 81. Number at dinner, 35.

TO OUR CONTRIBUTORS

Our members are urged to submit articles for publication in the BULLETIN. Short items are desired for the department of General Notes, as well as longer contributions, especially pertaining to life-history, migration, ecology, behavior, song, economic ornithology, field equipment and methods, etc. Local faunal lists are also desired, but they should be annotated, at least briefly, and should be based upon sufficient study to be reasonably complete. Authors are asked to include the common name, the scientific name (from the A. O. U. check-list), and annotations, and they should be arranged in this order. The annotations should include explicit data concerning unusual species. Omit serial numbering.

THE MANUSCRIPT. The manuscript, or copy, should be prepared with due regard for literary style, correct spelling and punctuation. Use sheets of paper of good quality and of letter size (8½ x 11 inches); write on one side only, and leave wide margins, using double spacing and a reasonably fresh, black ribbon.

The title should be carefully constructed so as to indicate most clearly the nature of the subject matter of the contribution. Where the paper deals with a single species it is desirable to include in the title both the common and the scientific names, or, to include the scientific name in the introductory paragraph. Contributors are requested to mark at the top of the first page of the manuscript the number of words contained. This will save the editor's time and will be appreciated.

Manuscripts intended for publication in any particular issue should be in the hands of the editor sixty to ninety days prior to the date of publication.

ILLUSTRATIONS. To reproduce well prints should have good contrast with detail. In sending prints the author should attach to each one an adequate description or legend.

BIBLIOGRAPHY. The scientific value of some contributions is enhanced by an accompanying list of works cited. Such citations should be complete, giving author's name, full title of the paper, both the year and volume of the periodical, and pages, first and last.

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Annual Meetings of the Wilson Ornithological Club

	Retiring President
1914—Chicago. February 5. Chicago Academy of Sciences.	
1914—Chicago. December 29-30. New Morrison Hotel	T. C. Stephens
1915—Columbus. December 28-29. With the A. A. A. S.	T. C. Stephens
1916—Chicago. December 27-28. New Morrison Hotel	T. C. Stephens
1917—Pittsburgh. January 1-2, 1918. With the A. A. A. S.	W. F. Henninger
1918—No meeting on account of the exigencies of war	M. H. Swenk
1919—St. Louis. December 29-30. With the A. A. A. S.	M. H. Swenk
1920—Chicago. December 27-28. With the A. A. A. S.	R. M. Strong
1921—Chicago. December 26-27. The Field Museum	R. M. Strong
1922—Chicago. October 26	T. L. Hankinson
1923—Cincinnati. Dec. 31, 1923-Jan. 1, 1924. With the A. A. A. S.	T. L. Hankinson
1924—Nashville. November 28-29-30. Peabody College	A. F. Ganier
1925—Kansas City. December 28-29. With the A. A. A. S.	A. F. Ganier
1926—Chicago. November 26-27. Chicago Academy of Sciences	A. F. Ganier
1927—Nashville. Dec. 30, 1927-Jan. 1, 1928. With the A. A. A. S.	Lynds Jones
1928—Ann Arbor. Nov. 31-Dec. 1, 1928. Museum of Zoology	Lynds Jones
1929—Des Moines. December 27-28. With the A. A. A. S.	Lynds Jones
1930—Cleveland. December 29-30. With the A. A. A. S.	J. W. Stack
1931—New Orleans. December 28-29. With the A. A. A. S.	J. W. Stack